



HINTS FOR HOSPITAL NURSES, ARRANGED BY R. WILLIAMS AND A. FISHER

RACHEL NORRIS, ALICE FISHER (OF THE FEVER HOSP,
NEWCASTLE-ON-TYNE.)

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Rachel Norris, Alice Fisher (of the fever hosp, Newcastle-on-Tyne.)

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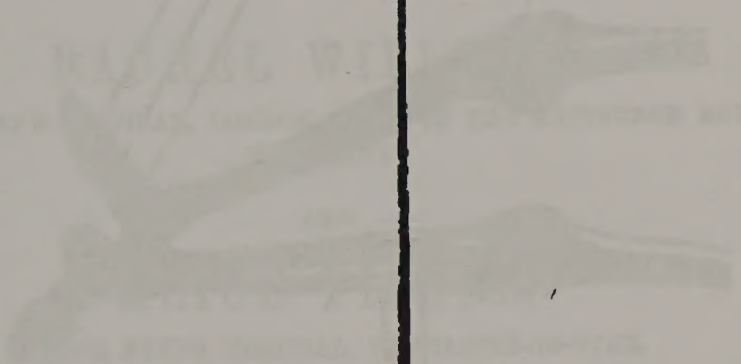
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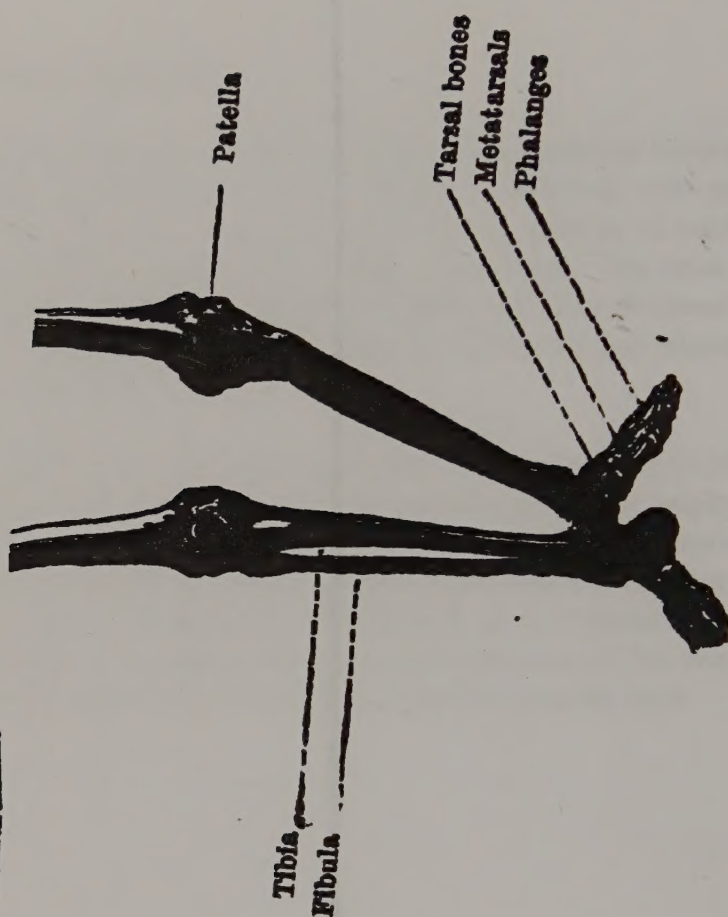
HOSPITAL NURSES.

RICHARD WILSON

OF ST MARK'S HOSPITAL, LONDON, AND OF THE LONDON HOSPITAL



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PRINTED BY THE AUTHOR.



Patella

Tarsal bones
Metatarsals
Phalanges

Tibia
Fibula

HINTS

FOR

HOSPITAL NURSES.

ARRANGED BY

RACHEL WILLIAMS,

OF ST MARY'S HOSPITAL, LONDON; LATE OF THE EDINBURGH ROYAL
INFIRMARY;

AND

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HINTS

HOSPITAL NURSES

OF THE

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OF THE SCOTTISH WIDOWS

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1871

TO
CHARLES JENNER, Esq.,

This Little Manual is Dedicated,

AS A

GRATEFUL ACKNOWLEDGMENT OF THE WARM INTEREST

HE HAS ALWAYS TAKEN

IN THE ADVANCEMENT OF THE ART OF NURSING.

CHARLES J. MURPHY, D.D.

OF THE UNIVERSITY OF CHICAGO

AND

OF THE UNIVERSITY OF TORONTO

LECTURES ON THE HISTORY OF THE HUMAN MIND

IN THE UNIVERSITY OF CHICAGO

IN THE UNIVERSITY OF TORONTO

PREFACE.

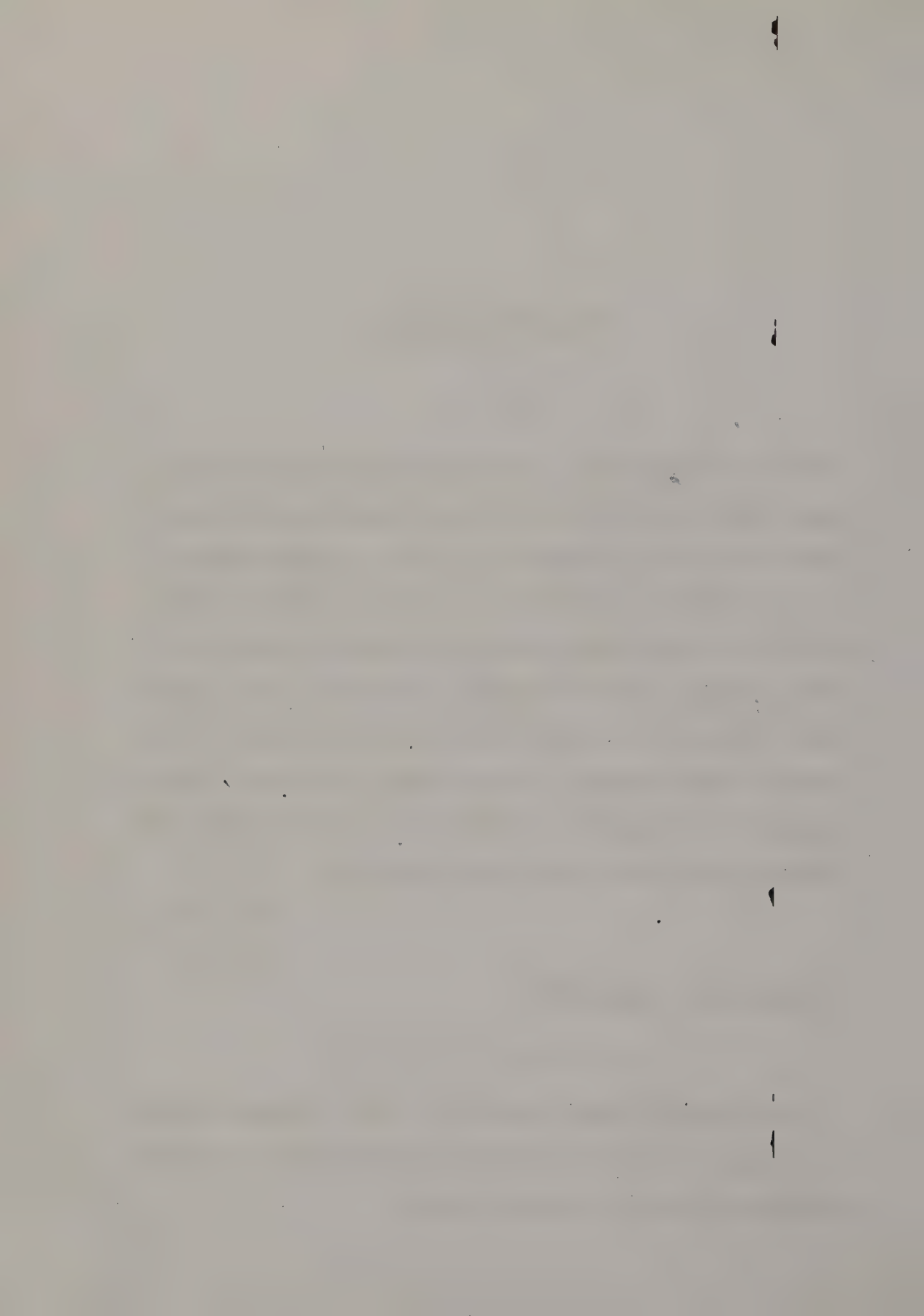
THE two friends who have compiled the following pages desire to offer their sincere thanks to the many authors by whose labours they have largely profited; to acknowledge specially the assistance afforded them by Mr Le Gros Clark, consulting surgeon, and Mr J. Croft, surgeon to St Thomas' Hospital; and to add that, without the kind and continuous help of Mr Joseph Bell, surgeon to the Royal Infirmary, Edinburgh, this humble contribution to the science of Nursing would not have been completed.

R. W.

A. F.

EDINBURGH, *March*, 1877.

This book has been shared in such a manner, that in writing, it has been found more convenient to adopt throughout the first person singular.



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HINTS FOR HOSPITAL NURSES.

CHAPTER I.

INTRODUCTORY.

THE question of the expediency of the employment of trained and educated women in the nursing of the sick, whether in hospitals, workhouses, or their own homes, is so wide that I do not attempt here to enter upon it; but I think a few words of practical information from one who is herself a hospital nurse may be of use, not only to those who have already engaged in the service, but to some who have been led to contemplate the adoption of nursing as a profession.

First of all, I would most earnestly entreat no woman to allow love of notoriety, false sentiment, or even a mere honest wish of earning her own livelihood to influence her in her choice. I am sure that of all the means by which it is possible to gain daily bread, there is none more irksome, more trying, nay, more positively revolting than the charge of the sick, if the nurse have not that inborn love of the work which is given, alas, but to few. But, on the other hand, if it so happens that she have this love in addition to other necessary mental and physical qualities, no calling can

be found which offers so happy a life, or where labour brings so quick or inevitable a reward, or which, in spite of many undeniable anxieties, secures such absolute peace of mind.

There are two classes whom those most interested in nursing are anxious to attract into their service. Respectable persons of the rank from which upper servants are usually taken, and a smaller number of more highly educated women, such as, for example, the daughters of professional, or naval and military men.

Women belonging to the first of these classes, after a year's training in a hospital, during which time they receive a slight remuneration for their services, will be eligible for employment as workhouse or private nurses, or if they remain in hospital service, for the position of head or staff nurse, as it is technically called. Their wages will average from £18 to £30 per annum, exclusive of uniform, and by-and-by it is very possible that they may be advanced to the matronship of some small provincial hospital, with a salary of £40, or thereabouts.

Ladies bringing with them higher qualifications of education, refinement, and knowledge of the world, after having undergone a precisely similar training to other nurses, are employed as "sisters" of wards, matrons, or sub-matrons of various nursing institutions, and some eventually arrive at the superintendence of important hospitals. A ward sister's salary commences at about £35, and does not exceed £60, and that of a superintendent is not often more than £80 or £100. It is possible that these salaries may

be, by-and-by, greatly increased, but at the same time it is not likely that any change will take place for some years yet. In addition to the sterling qualities and accomplishments of a good nurse, a hospital superintendent requires administrative power, firmness, combined with good temper, ready discernment of character, and a facility of dealing with the varied natures with which she is brought in daily contact.

Her life is a very trying one, and in it there are, generally speaking, few opportunities for the personal contact with, and charge of the sick, which form so strong an attraction to women imbued with the true nursing spirit.

There is little doubt that in the somewhat similar posts of head or staff nurse and ward sister there is, in spite of very hard work and small pay, much true happiness to be found for nurses.

Though I purposely abstain from entering into minute particulars, which must necessarily vary in different hospitals, I will attempt some explanation of what may seem a confusion of terms in the titles of ward sister and staff nurse.

The wards of most of our large hospitals, St Thomas' for instance, are each superintended by a sister, generally a well-educated woman, on whom the whole responsibility of its well-being, as far as regards nursing and management, rests. She attends the doctors during their visits, gives her report to them night and morning, receives their orders, and in her turn directs and assists the nurses under her in their treatment of the patients.

The sister of a ward has under her orders a staff, consisting of a head nurse, a night nurse, and a variable number of probationers, whose practical training she is supposed to superintend. In some hospitals where the wards are smaller, such as the Royal Infirmary at Edinburgh, Highgate Infirmary, and others, the two offices of sister and staff nurse are merged in one, and the charge of wards constantly devolves on women not belonging to the superior of the two classes I have named.

To be either a good sister or head nurse requires all the qualifications it is possible for a nurse to have; she should, in fact, be the very highest type of nurse—I may go further, and say the very highest type of woman.

Whether she intends remaining in hospital service or not, or whatever may be the special branch of nursing a woman intends to take up, it is unquestionably necessary that before undertaking any superior situation, she should qualify herself by not less than twelve months' training in a hospital as a probationer. Nowhere else can she see such an infinite variety of cases daily before her, or obtain such thorough insight into her duties, or such a practical familiarity with the requirements of the sick.

An intending probationer must not shut her eyes to the fact that this year's hospital training requires a very great outlay of health and strength, it also exacts almost all her time, and her undivided attention. During the period of probationership, all outside cares should, as far as is possible, be laid on one side, though a little light reading, such as a newspaper, or

pleasant book in the very brief period allotted for recreation, is a wholesome relaxation, and one not sufficiently indulged in by any class of nurse. A probationer is nearly ten hours on duty, the greater part of which is of a most fatiguing and trying character. Some of the work—such as bed-making, cleaning wards, etc.,—to be gone through, it must be remembered, indiscriminately by all classes,—is a great trial to the courage and physical endurance of many, whilst attendance on death-beds, operations, and other painful scenes requires continuous efforts of self-command hardly to be over-estimated.

Besides good health and healthy habits, which are of almost equal importance, nerve and constitutional cheerfulness are very valuable qualities in a nurse.

If with these essentials she combine unselfishness, and a strong resolution not to be conquered by difficulties, she will find none in her professional career so great that they may not be overcome by patience.

Of course, there are some women whose quickness of eye and delicacy of touch especially fits them for surgical nurses ; but it has been often remarked by those well competent to judge, that to be a thoroughly good medical nurse, requires natural qualifications of quite as high, though perhaps not so showy an order.

In large hospitals, where many probationers are trained, these have now constant opportunities afforded them of hearing lectures on subjects connected with their profession, notes of which they are expected to take. There are also examinations held for taking good places, in which prizes are awarded, and which

are a good test of the use the pupil nurses have made of the advantages bestowed on them. The subjects of these examinations are Elementary Physiology and Anatomy, the commoner scientific terms used in medicine, bandaging, and the essentials of medical and surgical nursing.

There are many training schools for nurses now scattered about the kingdom ; but whilst praise must be accorded to many, indeed, to most, I think it is universally allowed that the Nightingale Training School attached to St Thomas' Hospital, and the Royal Edinburgh Infirmary Nurses' School stand deservedly first.

CHAPTER II.

I do not intend to argue the point—a much vexed one—as to the exact proportion which theoretical should bear to practical instruction. For all purposes of higher technical information, there are books from which a nurse may herself obtain the exact amount of mental nourishment her powers of intelligence will enable her to digest, added to which, there are, as I have before said, in most hospitals, lectures given by members of the medical staff, which she has the advantage of attending.

When a woman comes into a hospital, whether she be highly educated or not, she will hear things talked of which she has never heard of before, and within half

an hour perhaps of her first appearance in a ward, she will be asked to furnish some article of which she knows neither the name nor the use. A surprisingly short time makes most acquainted with the technical expressions that they thought at first so difficult of comprehension, and on looking back they can hardly believe there ever was a period when they did not know the things they now consider so simple.

After attending a course of lectures given by a distinguished surgeon to the nurses of the hospital where he visited, the very valuable substance of which he had carefully translated into what most of us thought the language of everyday life, I was amused by the varied criticisms of his audience. "He can't think we pick up much information here—he talks as if we were children" said one. "It would have been beautiful, if I could but have followed him" admitted another with candour. It is to the latter class of listeners that these remarks are offered, and if in my pages are found words which they cannot understand, I heartily beg their pardon. Whilst to those in a position to smile at the simplicity of my little book I offer no apology, for they have but to close it, and seek another better adapted to their capacity. With a vivid remembrance of my own feelings on a similar occasion, I always feel great compassion for probationers newly arrived at the hospital, where they are to undergo their year's training.

Very few of them seem to know at all what they are about to undertake, some greatly exaggerate the difficulties they fancy they shall encounter, others are apt to laugh at the very idea of anything being required of

them, which they shall not be able to accomplish by the light of nature. Most experience a considerable amount of shyness, which is very natural, at finding themselves amongst a number of women with whom they are wholly unacquainted. This, however, soon wears off, and probably before they have been introduced to the ward where they are to begin their new work, they have laid the foundations of pleasant friendships, which may last, if neither friend be too exacting, during their whole year of probation.

And now I am going to say one word on rather a delicate subject—dress.

I have often wondered what the enormous box which is the almost invariable accompaniment of a probationer, contained.

Immediately on her arrival she is furnished by the hospital with a sufficient supply of caps and aprons, and in about a month afterwards she receives her uniform dresses, which she is expected always to wear whilst within the precincts of the institution where she is serving. Why then should she encumber herself with useless paraphernalia? For useless it nearly always is, it being quite the exception, when a probationer during her first month of trial, is provided with a gown at all suitable to her occupation.

Three good prints neatly and plainly made—for surely good taste alone would suggest how unbecoming fashionable polonaises, and other such adornments are to a person engaged in the homeliest offices—and a dress in which she can visit her friends, walk out, etc., are all that is really needful for the equipment of a proba-

tioner. To these must be added a good stock of under-clothing, which should, if possible, be new, as the probationer will find during her year of training that she will have little or no time to spare for the use of the needle. Not but what I may remark in passing, that really good needlework is an accomplishment well worth possessing. The great surgeon Sir Benjamin Brodie, wished that all his sons should learn to work with the needle, nothing he said, being better for giving delicacy of touch to the fingers.

Let me advise you to be very careful in your selection of the boots and shoes you intend wearing in the wards, for much of your comfort, and I may add that of your patients, depends on this. The way in which boots and shoes wear out in ward work is perfectly marvellous, and must be experienced to be believed in. The ankles of some are apt to swell, and the feet to become painfully tender, if very thin shoes are used during constant exercise. On the other hand, a noisy creaking footstep increases the sufferings of many patients greatly. It may be gathered from this that a wise discretion will avoid either extreme. I don't think that there is a word to be said in justification of tight boots or high heels—were it not that I have seen them worn in a hospital, I should not have imagined that any one taking upon herself the calling of a nurse could have thought them possible under the circumstances.

There used to be some rule that no nurse should wear hair pads, or false hair, when engaged in her professional duties. I don't know whether it is still in existence ; but it has certainly fallen into abeyance, if one may

judge from the enormous chignons and coils of plaits, which are now seen heaped upon the heads, not only of probationers, but of staff nurses who ought to know better. If it be true that "consistency is the first chapter in the book of taste," these ladies have certainly failed in the effect they have taken so much trouble to produce.

Affected simplicity is only another way of attracting attention. Surely every one can find some way of doing the hair, which shall be at the same time becoming, and not unduly conspicuous.

Persons unacquainted with hospital life have frequently asked the question, whether the mixture of every rank in one common occupation, under precisely similar conditions, is not productive of much social embarrassment. To this I can, from my experience, return a most emphatic negative. I have always seen the most perfect cordiality existing between the classes, and I think it is quite possible for both to derive great advantages from the close companionship into which, for a time, they must necessarily be thrown.

It is perhaps the first opportunity an educated woman has had of becoming perfectly acquainted with the moral and mental capabilities, and with the opinions and feelings of what is usually known as the "working class." Rightly used the experience may be very valuable to her, and will certainly enable her to enter more critically into the difficulties, and to sympathise more fully with her future subordinates, than she would otherwise be able to do. As to the "nurse probationers,"—to use the name by which they are generally designated

to distinguish them from the special or lady probationers—they cannot but derive good from association with women whose manners are more cultivated than their own. The greater part of the restraint they feel at first soon wears off, and what remains they may be assured is very wholesome.

Both classes have, there is no doubt, their peculiar difficulties. Some ladies feel a great repugnance to having many menial duties imposed upon them, which they think might well be done by others more accustomed to them. They are apt sometimes to *shirk* such things, or more often they do them with a want of alacrity, which gives both their fellow nurses and patients an impression that they want to shirk them. And they are vexed if a nurse probationer, as is often the case, does many offices requiring greater manual dexterity better than they do, or is put in any way in a more prominent position than they are. These will, I trust, forgive me for reminding them that there is nothing in a hospital more embarrassing than pride, whatever shape it may assume, and the dignity cannot be worth much that may not be left to take care of itself.

I have alluded to a feeling of restraint, which it is possible may be felt by probationers, who have perhaps been domestic servants, when admitted as equals into the society of those conventionally called ladies. This reserve is more to be commended than the behaviour of some, which anywhere else would be deemed impertinent, and who take a delight in a species of vulgar self-assertion, which is none the less trying, because it never amounts to a tangible offence against decorum.

In every community, more especially a mixed one, such as the nursing staff of a hospital must always be, there will be much mutual forbearance needed, many opportunities of self-denial, and frequent possibilities for the exercise of Christian charity.

If a good use is made of these, I think any probationer has it in her own power to look back upon her year of training as one of the happiest in her life.

CHAPTER III.

WHEN the probationer makes her appearance for the first time in her ward, properly equipped with cap and apron, a serviceable pair of scissors attached to her waistband by a chain or ribbon about half a yard in length, and a well supplied pincushion equally ready to hand, she generally finds that bedmaking is the first practical part of nursing with which she is expected to make herself acquainted.

I am not going to waste my time and yours in telling how to make beds.

Every hospital, and more than that, every ward in every hospital, has a way of its own, and you will learn more from ten minutes experience than from ten pages of writing. If you are a "nurse probationer," and have been in domestic service, you will probably master the difficulty in the course of your first morning's work ;

but if you have all your life been accustomed to mere sedentary occupations, you must not be angry with yourself if you do not succeed in giving satisfaction till after repeated failures. I know some otherwise accomplished nurses who acknowledge a guilty feeling that they never quite made their own the art of tucking in the corners of the quilts with uniformity.

The washing of patients is another thing regarding which a little practice is worth a great deal of theory. One broad principle may be laid down about it, however—wash a patient as you would wish to be washed yourself. I know there is a great deal to be said about a patient's fitness for being washed when the operation approaches the nature of a bath, whether or no stimulants should be administered before or after the exertion is encountered, but that is not the business of a probationer, but of the sister or nurse in whose charge the ward is. Your business is to do what you are ordered in the matter, to do it as thoroughly as you can, and with the greatest gentleness possible.

With respect to the other ordinary domestic employments of the wards, it is equally impossible, and, I may say impertinent, to lay down fixed rules for customs which are ever varying. You will probably be required to take your share of dusting, of feeding the patients, of dressing those that are helpless, and of preparing beef tea or broth for those who are unable to eat the regular ward dinner, which is cooked in the kitchens for them.

At the end of the book I have given one or two receipts for the common delicacies which it is possible

to make for hospital patients, warning you at the same time frankly, that you will find them of very little use as a probationer. Your culinary operations will be probably limited during your year of probation to making beef tea and arrow-root, and perhaps egg-flip, and I should advise you to cultivate the power of cutting bread and butter with speed and skill.*

Perhaps, now we are on the subject, I may as well tell you that there are few things more embarrassing than to be called upon, as you often will be, to boil from twenty to thirty eggs for the patients' tea. If they are boiled hard you will probably cause the unfortunate sufferers a sleepless night; if too soft, you will have to endure grumblings innumerable. It is impossible to boil more than six eggs at once, so that they shall all be tolerably well done. Most patients look forward all day to their comfortable tea, and I think the pleasure of giving it them as they like quite worth a little extra trouble.

As I have said, with the rest of the patients' food a probationer has but little to do. The diet ordered by the doctors is either sent up direct from the kitchens, or prepared by the ward assistants, and it is not always that a probationer assists in its distribution.†

* I know how valuable a quality speed is, but I trust I shall be forgiven the suspicion that rather too high a price is set upon it in hospital work, and whether the tenderness and gentleness which is such an essential of good nursing, is not sometimes sacrificed to obtain it, though I am far from extenuating a dawdle. *First*, thoroughness, *then* speed, *always* gentleness, are the conditions of efficient hospital service.

† At St Thomas' hospital she *never* does.

I wish it were otherwise, and would gladly see the kitchen of every hospital ward, when it has a kitchen, which is not always the case, become a little school of cookery in itself. When this day comes, however, there will, doubtless, come with it competent instructors in an art so useful.

The only thing to be said about a probationer's duties as to ventilation, is to insist on the virtue of absolute obedience. Be the ward stuffy, or be it draughty—and *every* ward has a distinctive character as regards this—reserve your opinion till you are in a position to enforce it; neither *sniff* nor *shiver*, but implicitly carry out the instructions of the head nurse, who is responsible on her part to the doctors.

I am going to conclude this portion of my book with a bit of advice, which needs no apology, as it is taken from the source of all wisdom.

“Rejoice in the Lord always; and again, I say, rejoice. Let your moderation be known unto all men. The Lord is at hand”—of which, amongst many renderings, I suppose the following may be permitted. Do everything not only without grumbling, but with ready pleasure. The value of sunshine in hospital work can hardly be over-estimated. Keep the peace with every body, which you will find you can only manage by extreme moderation in the use of your tongue, and do everything, down to the smallest, most menial office, as in the immediate presence of the Great Master, as though the Lord, indeed, were at hand.

CHAPTER IV.

ANATOMY.

I HAVE now come to the special part of a nurse's training, that which she can acquire nowhere but in a hospital. For such accomplishments as bedmaking, and the like, it is possible, as is quite obvious, to obtain in many other places.

There is no doubt that, to whatever hospital you go, you will receive very excellent practical instructions from the sisters and nurses under whom you may be placed in the various services required of you.

You will be taught to wait upon the surgeons during their visits to the wards, and to assist them and the dressers in the dressing of wounds, etc. ; and, as time goes on, you will probably, in many hospitals at least, have important dressings confided to your sole care. You will learn also to attend in the operating theatre, and to make yourself useful when there ; and you will likewise have to perform many minor surgical and medical operations yourself.

For all these special and personal teaching is absolutely necessary ; but I think you will learn a great deal more easily if you have some idea before hand of what you are about to see and hear, if you have some general knowledge of the why and the wherefore of the various processes into which you are being initiated ; and, finally, if the scientific words you hear used con-

vey some idea to your mind, instead of being spoken, as it were, in an unknown tongue.

To promote this end, I have subjoined to this little book a vocabulary of the commoner scientific terms used in medicine and surgery. I should advise you to read it over carefully two or three times, and to learn three or four words every day by heart. Nearly every hospital now-a-days possesses a library for the nurses; you, no doubt, have access to a medical dictionary,* and if you daily look out these few fresh words, and study their full meaning carefully, you will insensibly acquire a fund of knowledge which you will in course of time find very valuable. When once the more ordinary technical terms are acquired, you will stand no chance of forgetting them, as in the course of your ward work you will constantly hear them repeated.

I should like now to proceed to give such a general idea of anatomy and physiology as shall enable you to be intelligent nurses, and not mere machines.

To begin with, it will be well that you should first of all know the exact meaning of the word *anatomy*. It comes from a Greek word, which means literally dissection, or cutting up, and it generally implies the art of dissecting any animal body to discover exactly its structure.

Before going any further into the subject of anatomy—which, I may remark, I do not presume to do in the broad and comprehensive manner of those whose duty it is to teach medical students,—I wish you to obtain, firstly, a thorough and clear idea of the struc-

* “Hoblyn’s Medical Dictionary” is a most valuable possession for every nurse.

ture of the human skeleton, which is the frame-work of bone that supports the rest of the body.

The bones of which the skeleton is composed form a protection to the softer parts of the head and trunk, and in the limbs, are essential agents in locomotion and muscular action.

Bone consists of animal and earthy matters. The earthy matter gives the bone its hardness, the animal its toughness.

In the bones of children the animal, or gelatinous part, is so much greater than the earthy that, instead of breaking, they are apt to twist or bend like a green branch. In grown-up people, and especially in the aged, on the contrary, the proportion of earthy matter is much greater, and, the bones being brittle, they are liable to snap like a dry branch.

Both blood-vessels and nerves are found in bones, and the bones are joined together by ligaments and cartilages, of which I shall speak further on.

Your own common sense will tell you that the way in which it is most likely a bone will be injured is by breaking—by being *fractured*, as it is technically and properly called.

A fracture may be in one or more of three conditions or states.

1. Simple. When the bone only is divided without any external wound.

2. Compound. When the bone is broken and there is an external wound communicating with the fracture.

3. Comminuted. When the bone is splintered or broken in more than one place.

Fractures may also be complicated with other injuries, as when an artery is lacerated, or a joint dislocated, in addition to the fracture.

Occasionally a fracture takes two or more forms at once, as for instance a compound comminuted fracture, which is far from an uncommon injury. When once a bone is fractured it is liable to be displaced, not only by the violence of the accident it has probably sustained, but because a contraction of the muscles, which will be explained by-and-by, takes place, and causes the ends of the bones to overlap one another. The fracture is generally accompanied by swelling of the surrounding parts and pain. As movement is likely to increase the displacement, it may be taken as Nature's warning to keep the seat of the injury at rest. Nature makes no effort to replace the broken bone; the surgeon, therefore, extends the limb until the two ends of the bone are in apposition. This is called "setting a fracture." Nature, nevertheless, does much to repair the injury, for she throws out a material called "callus," which, congealing, first fixes, and eventually unites the broken ends. The surgeon, following her lead where it is possible, applies a splint externally, in order to ensure for the limb perfect rest in a proper position, though fractures sometimes occur in bones where it is impossible to give Nature this aid.

The number of bones in a grown-up person is fewer than in an infant, as in course of time some which are at first separate become united.

There are altogether in an adult 206 bones.

CHAPTER V.

BONES OF THE HEAD AND FACE.

THE skeleton may be divided, first of all, into three parts.*

1. The head or skull.
2. The trunk.
3. The extremities, or legs and arms.

The head or skull is divided into two parts, which are called the cranium and the face.

The cranium consists of 8 bones.

1 occipital bone situated at the base of the skull.

2 parietal bones on either side of the roof of the skull.

1 frontal or forehead bone.

2 temporal bones on either side above the ear.

1 sphenoid bone, which binds together all the other bones of the cranium, is placed across the base of the skull, near the middle.

1 ethmoid bone between the two orbits and the roof of the nose.

There are 14 bones of the face—facial bones as they are called.

2 nasal bones, forming the bridge of the nose.

2 superior maxillary bones, the upper jaw.

2 lachrymal bones placed at the inner part of the eye.

* I must advise my readers to refer constantly to the diagram with which these remarks are accompanied, otherwise I am afraid they will hardly be able to understand them.

2 malar bones, which form the most prominent part of the cheek.

2 palate bones, at the back part of the mouth.

2 turbinated bones placed along the side of the nose.

1 vomer, situated at the back of the nasal bone.

1 inferior maxillary, the lower jaw.

You will observe by turning to the diagram, or better still to the skeleton, if you are fortunate enough to have access to one, that the skull is a helmet-shaped covering, formed so as to be a strong and convenient protection to the brain, which lies within. Though I have not yet tried to describe the structure of the brain to you, I am sure you must all know what a wonderful and delicately arranged mechanism that must be which enables us to *think*, and what serious consequences may follow any injury to the skull which covers it.

Accidents entailing injury to the skull are of almost daily occurrence, and although the actual treatment lies with the surgeon, the nurse acting in concert with him, is able fortunately to do much to relieve and soothe her suffering patient.

An ignorant or careless nurse may do irreparable mischief in many of these cases. It is therefore desirable that she should learn simple facts, which may enable her to appreciate the importance of her charge.

After an accident to the head, a patient may be suffering either from compression or concussion. As the symptoms are somewhat similar and difficult to distinguish one from another, it is necessary that you should watch most carefully, and report accurately all that you observe, for by doing so you may be enabled to

give valuable help to the surgeon in forming his diagnosis.

The nurse should notice the state of the patient's unconsciousness, whether it is complete or not, the skin, the action of the bladder, whether he vomits, and whether there is any discharge from the ears or nose.

Watch also if either, or both of the sides of the face are paralysed or incapable of movement, and observe particularly the state of the pupils.

In cases of great depression, or where there is a fear of the patient sinking, you should apply hot bottles to the feet; remembering however the probable unconsciousness of your patient, be sure to place them *outside* the blanket to secure him from being burned. You may also try to restore animation by rubbing, or even by carefully administered stimulants; but unless there appears to be actual danger of sinking this last remedy should not be resorted to unless ordered by the surgeon. The patient is better left to nature, and it is imprudent in a nurse to foster too quick a reaction which might encourage inflammation.

Perfect quiet should be secured for the patient, who should be placed in bed, keeping his head on a level with his body, as far as is practicable.

The surgeon's orders will probably be to administer a purge, the patient's head to be shaved, and ice applied.

In all cases low and scanty diet is given.

There are few cases in which more careful and unwearied attention to orders and nursing is needed, than in an injury to the head, and even when a patient has made some progress towards recovery, it must be re-

membered that any undue excitement may cause a recurrence of the more dangerous symptoms.

Wounds of the scalp, however slight they may appear, should always be attended to, for if neglected, inflammation may very easily occur.

CHAPTER VI.

THE BONES OF THE UPPER EXTREMITIES.

WE have now come to the bones of the upper extremity or arm.

Each arm consists of thirty-two bones.

One clavicle or collar bone.

One scapula or blade bone.

One humerus, or bone of the upper arm.

Two bones called the radius and the ulna, which form together the forearm. There is not much difference between the size of these bones; but the radius is a little the smaller of the two. At the wrist, however, it is the larger, for it joins the wrist bones on the thumb side almost to the exclusion of the ulna. The ulna assumes more importance at the elbow, where it forms the point on which we rest the arm, and the two bones move together in a hinge like manner at the elbow joint.

When the hand is turned round, so that the palm is directed backwards, a process takes place which is called *pronation*, the radius rolling round the ulna; when this

process is reversed, and the palm comes to the front, it is called *supination*.

Eight carpal or wrist bones.

Five metacarpal, or bones of the palms of the hands.

Fourteen digital phalanges, or finger bones.

You have, as nurses, comparatively little to do in cases of fracture of the upper extremities. When you receive a patient suffering from fracture of any bone of the arm, he should be placed on a mattress, and the arm supported in a comfortable position till the surgeon arrives. You will understand from what I have said before the reason of his treatment, which will be to place the injured limb in a splint, and bringing the edges of the fractured bone together to keep them so without movement.

In certain fractures of the lower end of the forearm it is usual to have one splint longer than the other, the object being to prevent movement at the wrist joint whilst allowing the fingers full play.

In a fracture of the collar bone the patient should be placed in bed without a pillow, with the arm on the injured side folded across the chest.

In all cases of fracture rest and position are the main things aimed at.

In removing clothing from an arm which is not sufficiently injured to necessitate the garment being cut, you must take off the sleeve from the *uninjured* arm first, and in dressing the patient you must do exactly the contrary, drawing on the coat, etc., with great care over the bad arm, and leaving the other to push itself in as it best can.

CHAPTER VII.

BONES OF THE LOWER EXTREMITIES.

THERE are four bones in the leg.

Femur or thigh bone.

Patella or knee cap.

Two bones called the tibia and fibula. These two bones, which correspond with the radius and ulna in the upper extremity, are placed side by side, the tibia being much the larger of the two. The smaller bone does not form part of the joint at the knee ; but it acts as a prop to the under part of the head of the larger bone.

Seven tarsal or ankle bones.

Five metatarsal or instep bones.

Fourteen phalanges, or bones of the toes.

When a patient with a broken leg is first received, the limb should be carefully washed and placed between sandbags, till the arrival of the surgeon. If a male patient, you must be careful how you undress him, as any carelessness will greatly increase his sufferings. It is better to rip up the stitches of the outside seam of the trouser on the injured leg up to the band, which must be cut through. The trouser leg can then be removed with ease, that on the uninjured side of course equally so.

Fracture boards in these cases must always be placed under the mattress, to prevent the bed from sinking in the centre.

I think that this will be a fitting place for me to make a few remarks about that true terror to nurses—"bed sores." I have read nothing so valuable on this subject as some notes of a lecture given by Mr Croft, the medical instructor to the Nightingale Training School at St Thomas' Hospital, to the probationers, and I am sure I cannot do better than subjoin them. After insisting on the importance of a nurse possessing "more than a little" knowledge of these terrible accompaniments to sickness, Mr Croft proceeds to say :

"In the majority of cases in which bed-sores are found, they are the result of steady, long-continued pressure. Confinement to one position for many days is very likely to be accompanied by unrelieved pressure on one part, and bed-sore is very likely to be the consequence. Feeble persons, whose circulation is of course languid, are likely to become the victims of these dangerous accidents at quite an early stage of their illness. They are to be anticipated in acute diseases, after injuries, or operations in persons feeble and delicate, and during chronic diseases which involve long recumbency. In fevers and paralysis these often fatal complications must be guarded against. Amongst surgical cases you will observe that old people, who have sustained fractures at the top of the thigh bone, are prone to sores on the sacrum. If such cases are kept rigidly lying on their backs for many days consecutively, sloughs will almost certainly ensue. I cannot enumerate all the diseases, injuries, and operations which may become complicated by that cause of suffering ; it must suffice to repeat that they are to be anticipated in all cases which are confined to one particular posture in bed, and especially in the feeble and delicate. They may form very quickly or slowly during protracted recumbency.

"First signs and symptoms. A nurse ought not to wait until the patient *complains* of the first symptoms. She ought to see the first signs. If she does as she should—viz., inspect

the back and prominent parts every day, or oftener—she will see for herself the first *signs*, which are redness, rawness, and swelling. The earliest *symptoms* of which a subject is likely to complain are those of irritation, a sensation of soreness, of pricking, of lying on some rough surface, or on sawdust, salt, or fine crumbs. The sensation may be one of pain, and of a stinging character. If these signs and symptoms are neglected, there will presently appear a black spot of mortified or gangrenous skin, and that will be surrounded by redness and swelling; and if the patient be in a condition to give expression to his sensations, he will be restless, and say that the pain is of a burning character.

“The extent to which the slough may spread is, of course, variable. It may be limited to the skin in depth, but be as broad as a five-shilling piece. It may reach to the bone in the centre, and undermine the skin all round, forming a quaggy collection of pus as wide as a cheese-plate. The slough may very quickly become three inches across, and involve all the tissues down to the bone without any undermining. On the other hand, the stage of redness and irritation may never be passed.

“*Treatment* consists of two kinds—*preventive* and *curative*. The former is especially under the control of the nurse. She should see that the patient's sheets lie smoothly, and that he does not rest on folds or edges of the drawsheet. The bed should be freed from any lumps. It seems hardly necessary to add that crumbs and hard particles should be prevented from collecting under the person of the sick. Uncovered blankets are unsuitable things for the sick to lie upon, more especially such cases as may be liable to bed-sores.

“When the case is one in which there is any probability of a long confinement to bed, the parts most exposed to pressure should be carefully attended to. Now, the lowest part of the back, called the ‘sacrum,’ the hips, heels, and elbows, are the parts at which the pressure is sure to tell most. Those parts are to be kept scrupulously clean with soap and water, a soft sponge and towel being used in preference to flannel. The

nurse must be particular in thoroughly drying the places after the washing. After the cleansing the parts are to be brushed over with a saturated solution of alum, or with spirits of wine, or gin, or whisky, to harden the skin. Need I say that the hardening fluid is not to be wiped off the moment after it has been put on, but is to be allowed to soak in for three minutes or so? Lime or lemon juice is sometimes used for this purpose, and tincture of iodine is recommended. A solution of tannic acid, or an ointment of tannate of lead, is a good application. Flexile collodion is not suitable for the prevention of excoriations; it adheres to the clothes, and, if the patient be restless, the membrane formed by it breaks, is rubbed off, and adds to the irritation. I cannot recommend plaisters. Restless patients rumple and rub them off. Beyond cleanliness and applications to the skin, the nurse can do much to prevent sores by changing the posture of her patient, that he may not rest for any long time on one part of the body; she may also take off pressure from thinly covered and exposed parts by air or water pillows. The ring-shaped water cushion is especially adapted to relieve the sacrum from pressure. In bad cases it will be necessary to place the patient on a water or air bed.

“The *curative* treatment of these sores belongs to the surgeon; and I cannot too strongly impress upon a nurse the propriety and necessity of reporting to the physician or surgeon the threatening signs of a bed-sore as soon as she discovers them. A nurse is much to be blamed when she fails to do this.

“When a black spot has formed, and the condition comes under the category of gangrene, a poultice made of linseed meal, and an anti-septic carbolic acid lotion (1 to 80), forms the best application. The sloughs should be cut away. The neighbouring skin should be frequently cleansed from the discharges, which are irritating.

“The rest of the treatment, local and general, is to be carried on under the directions of the surgeon.”

CHAPTER VIII.

BONES OF THE SPINE.

THE spinal column, or backbone, as it is more commonly called, consists of twenty-four bones, or vertebræ, the sacrum, and the coccyx.

The word *vertebra* comes from the Latin word "to turn," and each of the bones of the spine turns in a very wonderful manner on the adjoining one. They have all a hole through the centre, so that when they are all put together a long canal is formed, which is known by the name of the spinal canal, which protects the spinal cord or marrow. This spinal cord consists of nervous matter in connection with the brain, and is so essential to life that most injuries to it are followed by death.

These bones are very strongly bound together by cartilage, indeed, so strongly, that they can be more easily broken than torn asunder.

The first bone of the spine turns on a pivot, which springs up from the second bone, thus enabling the head to turn in all directions.

The spine is divided as follows:—

Seven cervical or neck vertebræ.

Twelve dorsal or back vertebræ.

Five lumbar or loin vertebræ.

The lower part of the backbone is formed by the sacrum, or cross bone, which consists in reality of five

bones, but which, in adult life, have consolidated together so firmly as to present the appearance of a single bone.

This is the case, likewise, with the coccyx, or tail-bone, which is the lowest bone of all, and which can be divided into four separate bones.

In all cases of fracture of the spine, the slightest movement is attended by such intense pain that all attempts to undress the patient (at any rate if it be a man), otherwise than by cutting the clothing, will be found unavailing, though I need hardly say that unnecessary waste of clothing should always be avoided.

In injuries to the spine complete rest is essentially necessary, and this is obtained by attention to position. The body should be so supported that not the slightest strain is put upon the spinal column. Frequently the patient has to be placed on his face on an inclined plane. The forehead should be supported either with pillows for it to lean against, or by a sling suspended from above.

But, as a rule, there are few beds better suited for these cases than what is known as an "Alderman's couch," which is so constructed as to enable the nurse to attend properly to her patient's comfort with the least possible disturbance.

Fracture of the spine being constantly attended with paralysis, it often happens that the circular muscle that guards the outlet of the lower bowel loses its power of contracting and holding in its contents, and they are ^{cast} in bed involuntarily. The contents of the bladder also be voided unconsciously in the same

manner, or they may be retained, causing great and dangerous distension. This will have to be well looked to, and remedied by the use of the catheter. The constant dribbling away of water may exist when the bladder is distended almost to bursting, and is very apt to mislead the attendant. If the bladder is felt rising up above the bony line of the pelvis into the belly, as a large round tumour, relief should be at once obtained, even though the bed may be wet, and a constant small flow of urine taking place. The same condition of things may exist even when perfect consciousness is remaining. When the spine has been injured, and feeling and motion below the seat of the injury are lost, the person is as unconscious of his wants with regard to the bowels and bladder, as if he were in a state of complete insensibility.

These remarks apply to very many other cases than fracture of the spine, to all, in fact, in which the patient's consciousness is affected: but having once made them, I hope it will be unnecessary to repeat them at a future time.

All the care mentioned as so essential in the case of fractured thigh, will be equally needful in the present instance, for, in all probability, during many weary weeks the patient must lie on his back ere relief comes.

CHAPTER IX.

THE TRUNK.

THE bones of the trunk, or body, may be divided into those of the thorax and the pelvis. By the thorax is meant the cavity which contains the heart and lungs, and the bones by which it is protected consist of the sternum or breast-bone, which forms a sort of shield in front, and of twelve pair of ribs. Seven pair of these ribs are united by cartilages to the sternum, and are called the true ribs, whilst the remaining five pair, which are successively united to the lowest true rib, and to each other, are called the false ribs. These ribs being joined to the spinal vertebræ, form the sides of the thorax. A nurse can do little more for a patient suffering from broken ribs than bestow on him ordinarily careful nursing. The ribs will be bandaged with a roller, generally a flannel one, or numerous strips of plaster suitable for the purpose, and the patient should be kept in bed, in order that rest and the proper position may be maintained, for with any undue movement or roughness the broken ends of the bone would be liable to lacerate the pleura or membrane which covers the lungs, or perhaps to injure the lung itself. The nurse must be careful to observe whether the patient experiences any sensation of pain upon taking a long breath, coughing, or pressure upon any particular spot.

She should also give the character of the expectoration, and remark any sign which may indicate injury to the lung.

THE PELVIS.

The pelvis in grown up persons consists of two bones called the innominate bones, which, with the *sacrum*, which is so firmly knit together with them by cartilage and ligament, as to admit of no movement whatever between them, form a basin or pelvis, which contains the lower part of some of the organs concerned in the digestion of the food, and other offices connected therewith. Each innominate consists of three bones. The ilium or haunch bone, the ischium or sitting bone, and the pubic or share bone. These are separable in childhood, but become solidified when maturity is reached. The rim of this basin may be distinctly felt, where it forms the hips, and the body rests, in the sitting posture, on the rough prominences which constitute its lowest part. On either side it presents a deep cup, the *acetabulum*, in which the head of each thigh bone plays, the two forming the hip-joints.

You will easily understand that any injury to the bony structure of the pelvis will necessarily endanger, not only the very delicate organs contained in it, but others close by, and you must watch carefully for any symptoms of such danger. Retention of urine may prove laceration of the bladder. Injury to the bowel will cause intense and constant pain, which will be increased upon pressure, swelling of the abdomen, and inflammation, with vomiting. Bleeding may also occur from the tearing of a vein or artery.

Cases of this kind should be placed on firm well-filled mattresses, with the head slightly raised—better no pillow than too high a one.

There are also cases in which an ever vigilant watch must be kept up, or the terrible bed sore will inevitably make its appearance.*

CHAPTER X.

THE JOINTS.

A JOINT is the junction or union between two bones. Joints are divided broadly into movable, immovable, and mixed joints.

The movable are hinge joints, such as the elbow, ankle, and knee, and ball and socket joints, such as the hip and shoulder joint.

The immovable, such as those of the cranium, etc.

The mixed joints are those between the vertebræ, etc.

* Before I finish my remarks on the bones, I must mention a disease to which they are subject, and with which, as nurses, you will probably have a great deal to do. Necrosis literally means mortification. A form of disease closely resembling it, is called caries. It is, in fact, the decay or death of part of a bone, smaller or larger, as the case may be. Sometimes this is the result of an injury, more often disease. Generally speaking the necrosed bone is excised by the surgeon, and the decayed portion, being removed, the wound heals up, but occasionally when the disease is of long standing, or involves a large part of the bone, it becomes necessary to amputate the affected limb.

In some of the immovable joints the bones come into contact with each other; but all movable joints are covered with cartilage, a smooth shining substance, over which is a membrane, which is known by the name of *synovial*. This forms a bag, which is filled with a fluid called synovia, which lubricates or oils the surfaces of the joints. The whole joint is kept firmly together by muscles and ligaments.

There are several diseases which affect the joints, the principal are as follows :—

Synovitis, which means inflammation of the synovial membrane. This may be caused either by injury or exposure to cold. It may also be constitutional. The symptoms of acute synovitis are pain and swelling, caused by undue effusion of synovia into the joint, redness of the skin, and fluctuation.

Should these symptoms be treated lightly, or neglected, suppuration might set in, the cartilage be destroyed, and a serious disease follow. In a simple case of synovitis the surgeon will insist upon perfect rest, and may for this purpose place the limb in a splint, and will probably recommend soothing applications.

The joints are very liable to be affected by rheumatism and rheumatic gout, owing probably to the diseased state of the blood.

In these cases you should notice the peculiar nature of the perspiration, of the urine, and the character of the fæces. Be observant too of feverish symptoms, the amount and kind of rest and sleep obtained by the patient. It is best that the patient should be between

blankets to avoid the chilling effect of cold sheets, especially where the perspiration is profuse.

Ankylosis is a frequent result of many diseases of the joints. A joint is said to become ankylosed when it is stiff, either from adhesions of the tendons and muscles, or from actual union of the bony surfaces either fibrous or osseous.

Muscle is what is generally understood as the flesh of animals, and its proper name is "muscular tissue." It is the active power in a joint, and its value can hardly be over-estimated, if you will remember that most of the functions of the body need muscular power or action to perform their duties.

Various diseases affect the muscles and tendons; but that I think which will be most commonly brought under your notice in the wards of a hospital is called Talipes, or club-foot.

Children are constantly brought in to be treated for this deformity, with which treatment you will, as nurses, have not much to do. Frequently the limb is placed in irons made to fit it; sometimes a splint is applied, and occasionally what is called an extension is used.

There are four kinds of Talipes, and you may as well know how to distinguish between them.

Talipes equinus—the patient walks on his toes, and the heel is drawn upwards; varus—he walks on the outward edge of the foot; valgus—on the inner part; calcaneus—upon the heel, the front part of the foot being drawn up.

A patient may have two varieties of club-foot at once.

Tendons are attached to the muscles to connect the bone and muscle conveniently together.

Ligaments act as strong bands to bind down and keep in place the muscles and tendons.

CHAPTER XI.

THE SKIN.

ONE of the most important lessons that can be learned by a nurse is the value of cleauliness; and I do not think any better plan can be adopted of impressing this upon you than giving you a simple description of the functions of the skin. The skin is made up of two layers, which go by the name of cuticle, or scarf skin, or epidermis, and the true skin, or cutis. The epidermis covers the whole of the outside of the body, and the internal parts also; but it then loses its name of epidermis, and some of its characteristics also, and is continued under the name of epithelium. For our purpose it is unnecessary to mention the various names by which the epithelium is known, according to the different organs which it covers.

The cuticle consists of several layers of flattened cells or scales, varying in shape; the deeper layers are softer, and have in them the cells which contain the pigment, or colouring matter which gives the distinguishing colour to the black and white races. The outer scales of the epidermis are perpetually being

thrown off, and are replaced by the growth of other scales from underneath. Friction or pressure very much increases this growth, and this is the reason that the skin on the soles of the feet becomes thickened, and also the hands of those who do much rough work. The cuticle also protects from injury the true skin underneath, which is very sensitive—so much so that without it the true skin would not be able to act as an organ of touch or perception. The true skin contains blood-vessels and nerves, and is of a very elastic consistency; the deeper part of it contains the fat cells. These blood-vessels are called capillaries, and by means of them the blood is brought from the body to nourish the skin. In the skin are also found organs called glands, to which I will allude more fully presently, but will only tell you now that their office is to separate from the blood. There are two sets of glands, or small ducts, formed in the skin, which pour out different secretions on to its surface. First of all there are the sweat glands, which are the most abundant. These, after a spiral course through the cutis, terminate in a straight tube on the surface between the papillæ, which are little inequalities of the skin which play an important part in the sense of touch. The other, *sebaceous* glands as they are called, also open by means of small tubes on to the surface. They contain an oily matter which has much to do with the softness and pliability of the skin. The sweat glands are most abundant in the palms of the hands and soles of the feet, where the sebaceous glands are absent, the latter are most numerous in the neighbourhood of hair. When the

matter contained in these sebaceous glands is allowed to accumulate, it is apt to give rise to small pimples, especially on the face and neck. Sometimes these become inflamed and painful, constituting a disease called acne, which is very difficult to get rid of.

The quantity of perspiration varies according to circumstances, being, as regards its watery vapour, about twice as much as that given off by the lungs; and one of its uses is to cool the heated skin by evaporation. Free perspiration aids much in cleansing from the scales of the scarf skin. For this reason people who lead a sedentary life really require more washing than a working man, and should always use friction as well, for it is of as much importance, and perhaps even more so, than bathing. When I tell you that every inch of human skin is pierced on the average by 2800 sweat and other tubes for the purpose of throwing out waste matters from the system, and that if these millions of tubes were put end to end they would, in one person, measure eight and twenty miles, and that, not only are they useful for excretory purposes, but are also capable of taking in a certain amount of oxygen, you will see for yourselves the importance of keeping the entrance to them free from obstruction.

By-and-by you will see what a close relation exists between the skin, the lungs, and the kidneys, they being all charged with the office of carrying off water from the blood, and will easily understand that when the pores of the skin are blocked up and cannot perform their functions, the other organs have to do additional work, and sometimes become diseased in con-

sequence. When I come to the subject of scarlet fever, I shall have more to say about this.

There are many troublesome complaints of the skin alone, and many other affections of it, which are consequent to fevers, etc., which I do not intend to enter upon now ; but I will enumerate some of the skin diseases with which you will be likely to meet in your ward work, but to speak of them all would occupy more space than I have at my command.

First of all, there are several words you will hear constantly used in connection with skin diseases, which you should not only know the meaning of, but the difference between. Eruption means simply a breaking out. Pimple is a small pointed elevation of the cuticle, with an inflamed base, which seldom contains a fluid or suppurates, and generally ends in dandriff, or scurf. Vesicle is a little bladder-like elevation of the cuticle containing lymph, which is sometimes clear and colourless, but often opaque and whitish, or pearl coloured. This is also succeeded by scurf. Pustule is an elevation of the cuticle, with an inflamed base containing pus.

One of the most terrible of all the diseases to which the skin is subject is erysipelas. It is always characterized by fever of a low type, and a peculiar inflammation of the skin. Erysipelas may either be idiopathic, that is, coming on without any marked or evident course; or traumatic, the result of a wound or other injury in an unhealthy individual or hospital. There exist also the greatest differences in the nature and severity of the disease, some cases being slight

and resulting merely in a temporary and limited blush on the skin (erythema); others going on with great rapidity to the formation of vast abscesses in the cellular tissue. Such cases of phlegmonous erysipelas affect the constitution rapidly and profoundly, and are often fatal. Of the latter I will speak in its proper place, but at present I wish only to say a few words with regard to the first kind, to which persons of a sanguine or plethoric temperament are most liable. Those who have once had erysipelas are extremely liable to a recurrence of it under the influence of such exciting causes as cold, excessive heat, or the presence of irritating matters in the bowels.

An attack generally commences with *rigors* and other symptoms of fever, great confusion of the head, sometimes amounting to delirium, nausea, vomiting, a coated tongue, quick pulse, hot skin, and an elevated temperature. It is sometimes a few hours, sometimes as many as twenty-four before the eruption, which is of a bright red colour, appears. Usually it has a distinct margin, but occasionally it so fades away into the skin as to have no actual edge. At first the eruption is of no great size, but, gradually spreading, it occupies at length a great extent of surface. There is considerable swelling, and violent heat of the part inflamed, and when the face, as is most often the case, is the seat of the disease, the whole hairy scalp becomes affected, and the eyes are frequently closed. Sometimes the eruption subsides at one part, and reappears further off. This is called the erratic form. In about five or six days the eruption terminates in small watery vesicles,

and the cuticle is shed in scales. Sometimes, however, the fever does not abate at this time, but increases, and is accompanied by coma, and the patient dies about the ninth or eleventh day.

The worst form of erysipelas is when the inflammation involves the layer of fat and membrane between the skin and muscles. It is then called cellulocutaneous erysipelas. If this kind of inflammation goes on increasing, or is not properly treated, it ends in the extensive formation of matter and sloughs of tissue, to the great peril of the patient's life. If a favourable termination takes place, the part affected is left in a swollen and cedematous condition, which subsides in course of time.

The treatment of erysipelas varies according to whether it inclines to an inflammatory or a low type. The sort we generally see in hospitals is of the latter class, and requires wine and nourishment. A purge will be usually administered, and nauseating diaphoretics, such as ipecacuanha, etc. Lemonade, or soda water will be gratefully taken by a patient.

It is customary to dust over the inflamed parts with dry absorbent powders, such as starch, flour, or chalk. Sometimes warm poultices are used with great success, and sometimes cold spirituous applications to young persons, where the inflammatory action is strong. By many surgeons collodion is preferred to any other application, and should, if used, be painted over the parts likely to be overflowed by the erysipelatous discharges in order to protect them. Erysipelas is very infectious, perhaps more so to the other patients in the

ward than to the nurse in attendance, for it is more apt to attack persons in a weak state of health. A case of the kind is generally removed to a ward reserved for the purpose; but nurses have occasionally to take charge of doubtful cases in the same room with patients suffering from other disorders. It is impossible that she can be too careful in changing her apron, cuffs, etc., and in washing her hands in some disinfectant after attending upon an erysipelas patient before proceeding to another case. If possible, she should always take the erysipelas case last. Closely allied to erysipelas is erythema, a superficial inflammation of the skin, called sometimes inflammatory blush, which has several varieties. When it is of an evanescent, fleeting character, it is called *fugax*; but there is another kind, which is marked by ring-like patches, and another still when the edges are well defined. The treatment of erythema much resembles erysipelas, and though it is not generally believed to be infectious, there will be no harm in a nurse using the ordinary precautionary measures.

Eczema is another disease of the skin, of which there are a great many varieties. It is a cutaneous vesicular complaint, which sometimes completely covers the legs or arms. The treatment varies much according to the medical man under whom the case is placed, ointments of various kinds are generally applied, and daily vapour baths are very constantly ordered. One form of eczema, with which, I am afraid, you will have occasionally to do, more especially if you are much in the children's wards, is scabies or itch. Here the eczema is excited

by the presence of a very minute animalcule. Itch is produced by want of cleanliness, in the first instance, but is very easily conveyed by infection.

There is another class of skin disease, of which herpes or shingles forms one variety, and the different kinds of ringworm another; but there is nothing in the nurse's duties which especially calls for comment, except to recommend to her in discharging them the most minute and scrupulous cleanliness, both as regards her patients and the ablution of her own hands, etc., after attending to them.

Perhaps there is one word more which may be said. Skin diseases are often attended with great mental irritability. Patients are not often ill enough to command a great deal of pity, but they greatly stand in need of a kind nurse's sympathy; and it must be remembered that they are generally morbidly sensitive to the more or less loathsome character of the disease from which they are suffering, and keenly, even *fancifully* alive to any manifestation of disgust on the part of the nurse.

Though I do not think it necessary to tell you anything of the diseases to which either are subject, I will conclude this chapter by mentioning that both the hair and the nails are appendages of the skin.

The texture of the hair resembles that of the cuticle, each hair consisting of a series of cells. When a hair is drawn out from its bed, it is found to be deeply set in the true skin, and into the fat beneath. This bed is called the hair follicle, and at its bottom is a small conical projection of the true skin, a *papilla*, from

which the hair grows, just as ordinary cuticle is produced from the surface of the cutis.

The nails are also a development of the cuticle ; but here the scales are very closely compacted, so as to form a very hard and horny substance. A nail grows much in the same way that the hair does.

CHAPTER XII.

THE DIGESTIVE ORGANS.

THE use of food is to make good the incessant waste of substance and loss of heat which is going on in the body. Life is a process of alternate waste and repair ; and when this power of repair ceases, death ensues.

The system by which food is converted into blood, for the purpose not only of sustaining but of heating the body, is called assimilation, and this includes the process of digestion, or the solution of the food in the stomach, previous to its being further prepared and fitted for becoming a part of the body.

The machinery of the body is so beautiful that it is wonderful, whilst it keeps in good order, what different kinds of food it is able to make use of and turn into nourishment. There must be, however, in the food supplied to the body, certain *elements* which, as you will very often hear them talked of, it will be well to

name. They are oxygen, hydrogen, nitrogen, and carbon. The first three of these are gases, and the last is a solid.

Some kinds of food supply at once only one or two of these ingredients, but others—a bit of flesh or muscle for instance—possess in themselves all that is necessary for the nutrition of the body and the supply of heat. Some of the productions of the vegetable world contain all four of the elements I have named. It would be quite possible for a man to live on nothing but bread, only he would have to eat a great deal of it to obtain the amount of some of the necessary materials furnished by a very little bit of meat. Both the quantity and quality of what a person is to eat must be determined by his activity, and the temperature in which he lives. This has led to a division of foods into the kinds which supply each form of loss. Some kinds, for instance, which contain a great deal of carbon and hydrogen, are chiefly instrumental in producing heat, and it may be noticed that in cold climates the diet of the inhabitants consists of large quantities of oily food, which is nearly all carbon, whilst people in tropical climates subsist mainly on rice, and foods which keep up as little heat as possible.

The bulk of the body consists of a very large proportion of water, as does the solid food taken in, but yet the latter does not contain sufficient to replace the great waste of it which goes on, and which is accordingly expressly supplied by drink. In connection with this I daresay you will remember what a great source of waste the skin is, and I must also remind you that

every act, even of the simplest kind, involves waste which must be repaired.

This seems a fitting time to speak very briefly of the glands. These are, as I told you, organs, the office of which is to separate something from the blood. When what is separated is of a character useful to the body, it is called a *secretion*, when hurtful an *excretion*. Glands have blood vessels, and have, to carry off the excretion or secretion, ducts or canals, which end either in an open mouth or a receptacle. The process by which secretion is carried on is one of the most wonderful operations of the human machine. There is a great deal remaining to be found out about it, and what is known, is of too complicated a nature for me to enlarge on here.

We will now proceed to consider the process by which food becomes the new material of the body.

When taken into the mouth the teeth (which are imbedded in the upper and lower jaws, have blood vessels and nerves, and are worked by strong muscles) form a kind of mill or grinding machine, which seizes the food and masticates it.

It is meanwhile mixed with a fluid called saliva or spittle, which so moistens and softens the mass that it can then be more easily swallowed and digested. Saliva is one of the secretions, and is thrown into the mouth by means of the salivary glands. Besides moistening, it acts chemically on some kinds of foods. Careless or hurried people who bolt their food, dispense with this process of mastication, and very uncomfortable sensations in the stomach are often the consequence of doing

so. On the whole it is safer to swallow animal food hastily than vegetable, for the former will soon be dissolved, but the *starch* of which the latter largely consists, missing the action of the saliva, passes through most of the stages of digestion unchanged. Saliva has something to do with the sense of taste, and when, as is common to other secretions in many forms of illness, it does not properly fulfil its different offices, the mouth becomes dry and parched, and every form of nourishment is unpalatable. You must then, as nurses, do your best to supply the machinery which is wanting, and moisten the mouth and lips with some refreshing liquid, or a little lemon-juice, before urging food on the invalid. On looking into the back of the mouth the first thing which attracts your attention is a pointed projection hanging down from the centre. This is called the Uvula, and the sort of curtain from which it hangs is called the soft palate. On either side are situated muscles which draw up the soft palate, and so prevent the food from returning into the mouth or up the nostrils. Here the mass has to pass over the opening to the air-passage, or larynx, which lies in front of the food-passage of pharynx. This former entrance is extremely sensitive, and if, by accident, a small particle does escape into it, a most disagreeable sensation is caused, generally designated by the term of a "crumb getting the wrong way;" and not until the intruder is ejected is peace restored. However, safety is generally secured not only by the closing of the opening itself by muscles, but by a trap-door called the epiglottis, which is attached to the back of the tongue, and fitting

over the entrance to the larynx, closes over it at the same moment that the tongue pushes the mass of food backwards.

You should observe the curious manner in which, when once the food is placed thoroughly at the back of the mouth, it is impossible to avoid swallowing it. This is what is called involuntary muscular action—*i.e.*, the muscles acting entirely independently of the will.

The food now passes into the stomach through the lower end of the food-tube, which is called the *oesophagus*.

The end of the stomach into which it has passed is called the cardiac end, and the opening the cardiac orifice—both of these names being derived from the vicinity of the heart.

The stomach is a bag stretching across the upper part of the cavity of the abdomen, and lying chiefly under the lower part of the left ribs; the left end of it opening into the *oesophagus*, or gullet, is much larger than the other.

You must not forget that, when referring to diagrams, you are looking, as it were, into a looking-glass; and that, for example, the left or cardiac end of the stomach seems in the picture to be on your right hand side. The other end of the stomach, which is called the pyloric, is much the smaller of the two, and is guarded by a strong ring of muscle, which prevents the food from proceeding too soon on its onward journey.

The food, we now find, is again acted upon in two ways, chemically and mechanically. The muscles of the stomach cause a constant movement to take place,

which much resembles the action of a churn, whilst the interior of the stomach is studded with glands, the mouths of which pour out into it the gastric juice, or dissolving fluid of the stomach. The gastric juice is acid, and, like the saliva, consists in a great measure of water, but the active principle in it is called pepsin. It is this ingredient with the acid which really dissolves the food, and the churning movement I have mentioned brings each particle under its action. As you may imagine, the stomach is a part of the human machinery very likely to be disordered. So many, in fact, are the maladies to which it is subject that I can do no more than mention a few of the more common, which you will be likely to meet with. *Gastritis*, or inflammation of the stomach, is characterised by an acute fixed pain, and a burning sensation in the region of the stomach, which becomes worse on taking food, or on pressure. There is violent vomiting, frequent hiccup, and great thirst, sometimes accompanied by sore throat; and it is astonishing in how short a time the patient becomes alarmingly weak. If you feel the pulse you will find it small, hard, and very quick. There may be many causes for gastritis, but the most common are poisons taken into the stomach, or the excessive use of alcoholic stimulants. It may also be occasioned by the sudden application of cold, either outwardly or inwardly, by drinking cold liquors when the body is warm.

The usual way of treating gastritis is by hot fomentations, the flannels used being generally plentifully sprinkled with opium. The bowels are more often

kept open by means of enemata than by other medicines. Opium also is very constantly administered, and sometimes hot bottles are used in such a case.

You will observe that neither in this or in any other of what must be called medical, in distinction to surgical cases, do I try to lay down absolute rules for you as nurses. All that I have said to you previously as to the necessity of tenderness and watchfulness applies here, and the power of strict observation of symptoms is more valuable here than in a surgical case. There a medical attendant is able to use his own eyesight as a means of information : here he is in a great measure dependent on your statements and those of the patient, which latter are very often far from accurate. The reason that I am trying to give you some general idea of the diseases which you are likely to meet with is, that you may know what symptoms to watch for. I must give you one caution, however,—Don't let the power of anticipating the probable symptoms make you *imagine them*. I think, on the whole, that this and the habit of exaggerating symptoms are worse faults than the "eyes and no eyes" stupidity with which the nurses of the old school used to be charged. *Absolute* accuracy is a habit which some people find far more difficult of acquirement than others. Whilst on this subject I must warn you that you will find the medical wards of a hospital much duller than the surgical. The patients are generally more seriously ill, or, at least, their constitutions have perhaps been impaired for years, and this affects their spirits in a way unusual even in the most serious surgical cases.

Also, on coming into a medical ward, after having been in a busy surgical ward, full of excitement, and of hurrying (however gently) to and fro, you are apt to think the first day that there is nothing for a probationer nurse to do. In less than a week you will find your mistake, and be ready perhaps to agree with the authority I quoted in my first chapter, that there is, after all, more real nursing here than in surgical cases. There is less that can be reduced to rule ; but there is, for that very reason, a wider scope for that common sense which is the most uncommon of all senses.

Private judgment though, however well founded it may appear to be, must never be allowed to interfere with the most absolute obedience to the doctor.

Gastric ulcer is a very common disease of the stomach, and, like all others affecting that organ, it is accompanied by vomiting—the vomit, in this case, consisting of mucus and blood, and a stuff like coffee grounds. Blood may not only be thrown off the stomach by the mouth, but be passed by the rectum. There is intense pain in the stomach, and a burning, gnawing sensation. The treatment of gastric ulcer depends so much on the particular opinion of the physician, that any remark on my part would be uncalled for.

Cancer of the stomach presents all the painful features of the last mentioned disease, with the sad certainty that nothing but death can bring relief to sufferings which, towards the last, are generally only made endurable by keeping the patient more or less under the influence of morphia, or some other sedative.

Need I say that in all these diseases of the stomach, and, indeed, in all *medical* cases at any rate, it is the nurse's business to preserve for the physician's inspection a specimen of urine, and any unusual vomited matter or fæces which may be passed.

Little by little the semi-digested food passes through the valve of the *pyloric* end of the stomach, into the bowel or intestine, changing its name into *chyme*. Here, again, the food or chyme is chemically acted upon, and changes thereby its character and name.

Lining the membrane of the intestine are numberless small ducts or tubes thickly covering the interior of the bowel, which are said to have the appearance of the *pile* of velvet. These absorb and suck up the fluid now changed into *chyle*, and carry it into a number of minute vessels outside the bowel called *lacteals*, the duty of which is to empty the fluid into the *thoracic duct* (so called from its traversing the thorax), from whence it passes through the vena cava superior towards the heart. A large proportion also of the chyle is absorbed by the blood vessels of the intestines and stomach, and from thence passed through the portal vein into the liver. The undigested portion of the food passes along the large intestine or colon, where a further process of digestion takes place, the refuse is passed into the rectum, and from thence ejected.

It will be necessary here to describe the bowel or intestinal canal. In a grown up person the length of the canal is about twenty-five feet, the greater portion of which is small in size, and called the small intestine, and the remainder, about five feet in length, is

called the large intestine. Scattered along the surface of the canal are numerous glands for the absorption of the chyle, and also a number of minute projections, spoken of elsewhere as villi. Between the small and large intestine is a valve; these valves, of which there are a great many in the human body, are all constructed on the same principle, and for the same purpose; being folding doors or traps opening only in one direction, in order to prevent the return of the contents of the canal or cavity, to which they are an entrance, which guards the communication between the two, and is usually a sufficient protection against the return of the contents of the latter into the former. Sometimes, however, this does occur, and a serious consequence occasionally ensues, which is called *intussusception*. This is one part of the intestine slipping inside the other in the way that you have probably seen the finger of a glove do. One of the symptoms of this accident is constant sickness, and another intense pain.

It may be well whilst we are talking of the structure of the intestine to name another accident to which it is extremely liable. You will not have been very long in a surgical ward (for an accident of this kind becomes a surgical case), without having an opportunity of seeing a case of *hernia*.

A *hernia* is a protrusion of any of the viscera from its natural cavity through an unnatural opening, or through a natural opening involuntarily distended. I daresay this seems rather hard to understand at first, but when once you have thoroughly grasped the idea

of it, all the rest will seem comparatively easy. A hernia does not necessarily mean a protrusion of the *bowel*, though the term is usually restricted to that. It may take place with other viscera besides the bowel, but hernia of the bowel is the only one with which you, as nurses, have to do, and of which it is necessary here to speak. You are now acquainted with the structure of the intestine, which lies in a cavity called the *abdomen*. The whole of the abdominal cavity is lined with a serous membrane called *peritoneum*, which forms a shut sac, on the outside of which lies the viscera which it protects. The inside, or lining of the bag, is smooth and moist, so that the two (for the bag, you must remember, is an empty one), may easily slide one over the other. The outer side of the bag is that which adheres to the parietes, or walls, of the abdomen, with which it is loosely connected, and it is this outer side of the bag of peritoneum which forms the sac, which the protruded bowel pushes before it when the hernia *descends*, as it is called. There is more than one variety of hernia of the bowel; but there are only some of which it is needful to speak. These are named first according to their position; and, secondly, according to the condition of the protruded viscera.

First there are Inguinal, Femoral, and Umbilical, and these are again classed into Reducible, Irreducible, and Strangulated.

I will very briefly describe the position of the first, and nature of the second. *Inguinal* hernia is that which protrudes through one or both abdominal rings.

Femoral hernia occurs in the neighbourhood of the femoral veins and the ligaments called Gimbernat's and Poupart's ligaments and the pubes. *Umbilical* hernia protrudes through the umbilical opening.

A *reducible* hernia, as the name indicates, is one capable of being replaced into its natural position, and by wearing a truss, or support, no great inconvenience is experienced.

A hernia may be irreducible in consequence of its size, or through adhesions of the thickened omentum, or folds of peritoneum.

Strangulated hernia not only cannot be replaced, but also suffers *constriction*, which interferes with the passage of the contents of the bowel, and impedes the return of the venous blood, resulting in swelling and even gangrene. Protrusions in other parts receive different names.

Having now some knowledge of the anatomy of the part affected, and of what a hernia really is, the causes of the displacements naturally suggest themselves to your minds. These are weakness of the walls of the abdomen, straining of the muscles, which, when strained, or pulled out as a piece of elastic, on being relaxed, or let go, force the bowel through the walls of the abdomen, pushing with it the mucus membrane. The *exciting* cause is generally violent bodily exercise, lifting heavy weights, rowing, pulling, etc. The symptoms in each variety, of course, differ according to the nature of the hernia. In that termed *reducible*, a small compressible swelling appears at some part of the abdomen, which increases in size if the patient is in an upright

position, decreasing or disappearing when recumbent. In an *irreducible* hernia, the soft compressible bump is always present in any position.

If the hernia is strangulated, however, in addition to the presence of the swelling, the symptoms are strongly marked. Vomiting is invariable, intense pain and tenderness; the patient lies with the knees drawn up, complains of tightness across the abdomen (umbilical pain), the countenance is pallid and distressed, and there is great restlessness.

The surgeon generally endeavours to reduce a hernia, even if strangulated, without having recourse to a surgical operation, and for this purpose a hot bath is occasionally used, and what is called taxis, or reduction, by means of the hand, is tried, but if this is unavailing, a very serious operation becomes necessary. Though a nurse has seldom much to do with the dressing of a case of hernia, it is one which requires her incessant care. The object being to maintain perfect rest of the part affected, it is a very good thing to support the patient's knees with a couple of pillows placed under them. Light and unstimulating diet is given, and the patient must be saved the slightest possible exertion. A nurse should refrain from giving even the simplest aperient without an order, and should watch carefully for sickness, pain in the abdomen, or bleeding.

You will often hear the different regions of the abdomen spoken of, and will find it useful to know that chiefly for purposes of description, it is mapped out into nine divisions.

There are three horizontal zones, as they may be

called, each of which are again divided partially into three divisions. The middle region of the upper zone is the *epigastric* region ; on either side are the *hypo-chondria*. The middle region of the middle zone is the *umbilical* region ; on each side are the *iliac* regions. The middle region of the lowest zone is the *hypogastric*, with the *inguinal* regions on each side.

The peritoneum, of which I have already spoken to you, is a membrane which very readily becomes inflamed. Peritonitis, as this inflammation is called, may arise from cold, like other internal inflammations, or it may result from other complaints. Occasionally it follows some operations, such as hernia, ovariectomy, etc., and for this reason you should make yourself well acquainted with the symptoms of it.

Peritonitis is characterized by feverish symptoms, and pain in the abdomen, which is not only increased by pressure, but by drawing a long breath, coughing, etc., and also by sitting up, hence the respiration is shallow and hurried. Sometimes the pain occasioned by pressure is so great that a patient cannot even bear the weight of the bed-clothes. A nurse should try to alleviate this by placing over the patient the wire or wicker work contrivance, known in hospitals as a *cradle*, so as to keep this pressure from him. The pain, which is at *first* confined to particular spots, soon spreads over the whole abdomen. The patient generally remains lying on his back, with his legs drawn up, and you will observe that his respiration is generally peculiar. He never draws a long breath, for the reason, that in a full inspiration the inflamed mem-

brane would be pressed upon by the diaphragm as it descended. Therefore, less air being admitted at each inspiration, you will find the breathing necessarily quick, and there are often forty or sixty respirations in a minute.

Acute peritonitis generally sets in with a rigor and some peculiarity of pulse. Often before a fatal termination this becomes very quick and feeble. The abdomen frequently becomes much distended.

Besides the remedies which lie solely with the physician, peritonitis is generally treated with hot poultices on the abdomen, or with constant hot fomentations. Some physicians order cold applications in preference to the warm, cold enemata, and cloth dipped in evaporating lotions. Leeches are also often applied in great numbers to the abdomen.

In *enteritis*, or inflammation of the bowels, you will find many of the same symptoms as you have observed in peritonitis, with this amongst others, in addition, that there is impaired function of the intestine. Continued obstructions in the bowels cause inflammation. These obstructions may arise from many reasons. Cold, exposure to which is particularly injurious after a meal, or the impediment may occur *within* the bowel, hardened fæces or intestinal concretions. Very curious formations sometimes take place in the bowels, which usually have a beginning in something which the patient has swallowed, and which has passed into and never out of the bowel, such as fish bones, cherry stones, and the like. Enteritis resembles gastritis in being one of those maladies which are so severe that a

termination of one kind or another cannot be long delayed.

With the continued costiveness to which I have alluded there is often violent straining, a dark, very offensive, or bilious matter is vomited, there is a very high temperature, and the pulse is slow, hard, and contracted.

Hot fomentations are generally used to allay the inflammatory action in the bowels, and every effort must be made to overcome constipation.

Nevertheless the nurse must, in such a case as this, be most careful not to act on her own responsibility as regards the administration of any medicine, as an inopportune or unsuitable purgative might cause the death of the patient.

Enemas are most generally administered. As long as any obstruction in the bowels exists no real change for the better can of course be expected; but when this has been reduced, a gradual cessation of pain may be hoped for. This is generally accompanied by a comfortable perspiration, a decrease in temperature, and a more natural condition of pulse. The urine also, which will have been previously scanty and high coloured, will be more plentiful, and will deposit a sediment.

The most unfavourable conclusion that enteritis can have is gangrene, which is generally marked by a sudden cessation of pain. The lips and face become livid, the extremities cold. There is often a suppression of urine, hiccup, and twitching of the muscles. Death is generally accompanied by delirium or convulsions.

The disease called *colic* is very often combined with enteritis, but it sometimes exists by itself. When it does so, there is this striking difference between it and enteritis. In colic there is seldom fever, and the pain is mitigated by pressure. You will often have opportunities of seeing persons suffering from colic induced by lead-poisoning. Painters are very subject to it. You will notice in such cases a curious palsied state, or dropping of the arms and hands, which proceed from the wasting of the muscles. There is also a thin, bluish line on the gums, just where they meet the teeth. Besides other remedies, electricity has been tried with great success for the relief of this sort of colic.

I hope that you may never be called upon to nurse that most awful of diseases, Asiatic or malignant cholera; and I only mention it to tell you that it is a very different thing from the English cholera, which often visits us, more especially in the autumn.

You are all probably acquainted with the malady called diarrhoea, by which is usually meant frequent, loose, or liquid evacuations of the bowels. Diarrhoea constantly accompanies other diseases, and is at other times often an effort of nature to get rid of some irritating and offending substance in the intestines. After the irritant has been got rid of, the purging generally ceases, though you will meet with cases under treatment in the wards where it has become *chronic*.

The ordinary proceeding is not to stop diarrhoea, but to favour the recovery by diluent drinks, etc.; and it is often hastened by first sweeping out the intestinal canal with a purgative, and then soothing it by an opiate.

English cholera is diarrhoea and something more. The attack is generally sudden, and consists of an enormous discharge from the bowels, and also by vomiting of a bilious, acrid fluid. There is a burning sensation in the abdomen, and spasms occur, after which the patient grows cold and faint. Death sometimes occurs.

In this complaint opium is most constantly administered, and there is very much in the power of a good nurse, as regards the external remedies, which may be ordered. Mustard poultices, hot salt applied in a bag, and hot flannel sprinkled with oil of turpentine, will be laid on the abdomen, and the cramps in the extremities, which generally torment the sufferer, may be allayed by constant friction.

When the state of collapse is very great, the patient should not be allowed to raise himself, as fatal faintness may follow.

I need hardly tell you how much a patient depends, in such a case, on a nurse. She must be most scrupulous as regards cleanliness—not a very easy matter very frequently—no discharge from the patient should be suffered to remain an instant in the room, and all sheets, etc., soiled by it should be subjected to a purifying process apart from other linen.

The great difference between this and the terrible malignant cholera is that the evacuations in the latter case contain no bile, but consist of a whitish fluid resembling the water in which rice has been boiled. An awful state of collapse comes on very early in the disease; death is known to take place in two or three

hours, and is seldom, in fatal cases, delayed longer than fifteen. A great proportion of cases terminate fatally.

I must not forget to remind you of the constant movement which takes place in the intestinal canal. This is called the peristaltic contraction of the intestine, and is a worm-like movement which propels the contents of the canal onwards.

A fluid called the intestinal juice is also secreted by the bowels, which assists in the assimilation of food.

The intestinal canal is sometimes infested by worms. There are five kinds, which you will be likely to see specimens of in your nursing experience. I will give you simply the common names for them.

The round worm, the thread worm, the long thread worm, and two kinds of tape worms.

The presence of worms, which depends greatly on the patient's general health, is accompanied by intolerable itching in the neighbourhood of the rectum, griping pains in the abdomen, and a prevailing feeling of discomfort, and their discovery by the nurse occasionally explains symptoms which have been attributed to other complaints.

Having now furnished all that my limited space permits me to say about the intestinal canal, I must ask you to go a few steps backwards with me to where the canal joins on to the pyloric end of the stomach. This, the small end of the canal, is called the *duodenum*. Two important glands open close to one another into the duodenum. These are called the liver and the pancreas or sweetbread.

The liver is the largest gland in the body, and per-

forms a double office, for it separates from the blood which is supplied to it in large quantities, certain deleterious ingredients, and also forms an important agent in the digestion of the food. The liver is a manufactory for *bile*, which it supplies through a duct into the duodenum. As this manufacture of bile is always going on, a reservoir is provided for the surplus quantity. This is called the *gall bladder*, and has a duct meeting that from the liver, and opening into the small intestine.

The pancreas or sweetbread is concerned in the digestive economy, and is placed beneath the liver and stomach. It secretes a fluid somewhat resembling saliva, and one of its functions appears to be to convert the starch which is found in many articles of food into sugar, and so rendering it soluble. It also makes fat soluble, by turning it into a milky fluid. Its duct opens, as I have said, close to that of the liver. The office of the spleen, which lies under the left ribs close to the larger end of the stomach, has been much discussed, but it takes no direct part in the digestion of the food. It has no duct.

There are a great many diseases of the liver, and in common with most other organs it is subject to inflammation.

Inflammation of the liver or hepatitis, may be either acute or chronic, and both forms are more common in warm climates than here.

Still a large proportion of the diseases in our medical wards are complaints of the liver of this or some other kind.

There is in acute hepatitis usually pain in the right side, feverishness, difficulty of breathing, vomiting and cough, and the patient finds himself unable to lie on the left side.

The pain, which is sometimes sharp, sometimes dull, extends occasionally to the top of the right shoulder. There is often a difficulty in deciding whether the seat of the inflammation is in the lung or liver, and a nurse must be most accurate in detailing every symptom to the physician which may come more particularly under her notice.

Abscesses often form in the liver, and its substance is subject to changes of different kinds, morbid degenerations as they are called. Sometimes there is a great increase in the size of the liver, sometimes diminution. Intemperance tends to generate diseases of the liver, and there is one which is known by the name of "gin drinker's liver."

Inflammation of the liver is sometimes accompanied by jaundice.

The striking features of jaundice are the yellowness of the skin and of the eyes ; whitish fæces, and urine having the colour of saffron, and communicating a bright yellow tinge to linen. This yellow colour is supposed to be owing to the presence of the colouring matter of the bile in the blood.

It is alleged that jaundice is occasionally caused by fits of anger, fear, and of alarm, and it has been noticed as having been prevalent after a continuance of very hot weather.

All diseases of the liver require particular *medical*

attention. I need hardly say they also demand good nursing ; but they are not dependent on it as a rule in the same kind of way as sufferers from intestinal maladies. You must remember one thing however, that liver complaints are generally attended with distressing depression of spirits, and that a nurse has much in her power besides administering the prescribed remedies, to contribute to her patient's care, by cheerfulness and patient consideration.

It has already been mentioned that the *lacteals* perform the duty of carrying off the chyle from the alimentary canal to the thoracic duct. These lacteals form only a division of a system of vessels pervading the whole frame, which contain a fluid called lymph, and are called *lymphatics*. The office of the lymphatics is to carry the lymph, which appears to be a part of the waste material still available for nutrition, to the *thoracic duct*.

The thoracic duct begins in a receptacle below the diaphragm, where it receives all the lacteals, and the lymphatics from the lower part of the body. After proceeding through the chest, at the side of the spine, and towards the neck, it terminates in the junction of the two great veins of the arm and head, on the left side of the neck ; the lymphatics of the right side of the upper part of the body open into the corresponding vein of that side. These openings are protected by valves, which prevent the blood from flowing into the lymphatics.

There are four principal organs of excretion, or means by which the refuse matter, which cannot be employed

in the nourishment of the body, is cast off from it. One of these, the skin, we have already considered. The excretion from the intestinal canal we have also mentioned. There now remain to be spoken of the kidneys and the lungs.

There are two kidneys, one situated on each side of the spine in the lumbar regions of the abdominal cavity. They are slightly larger, though in shape similar to the kidney of the sheep. The function of the kidney is to separate from the blood by a filtering process some saline matters, a compound called urea, and water. Urea, if not removed from the blood, is highly poisonous. Its principal ingredient nitrogen is derived from the waste of the tissues, and from the excess of animal food. Its quantity therefore is influenced by causes operating on these sources of supply ; and so long as the kidney acts healthily, and is not overtaxed ; it is an important safeguard against the accumulation of unrequired material in the system.

It must be remembered that all excess in eating and drinking excites the excretory organs, especially the skin, the liver, and the kidneys, to unnatural efforts ; and the consequence of want of moderation must be, sooner or later, first functional derangement, and then structural change.

The other name for inflammation of the kidneys is nephritis. Many of its symptoms closely resemble those of colic, and its treatment is also somewhat like it. Nephritis does not often arise of itself, if one may use the expression, but generally accompanies some disease, it may be of the kidney or of some other organs.

Formations called calculi are apt to form in the kidneys, and in their passage to the bladder to cause great pain. There are many varieties of these calculi which, when they do not take the form of solid substances, are called gravel. A calculus sometimes occasions a very serious surgical operation, which I have spoken of further on, as I have also of some of the commoner methods of testing urine, which I think it will be useful for you to know.

Urine, as I told you, is a separation from the blood. The urea is removed from the blood by the kidneys ; but if this separation does not take place, it accumulates in the blood, circulates with it to every part of the body, and acts as a poison, especially upon the brain.

Suppression of urine is, like nephritis, generally a symptom of some disease ; but it is a condition which requires very active treatment, for if it be not soon relieved, coma comes on, and death will follow shortly.

Cupping on the loins, the hot bath, medicine to promote the action of the skin, which has, as I explained to you, a great deal to do with the kidneys, are some of the usual remedies, and large warm enemata are often useful.

It is important that nurses should not confound the terms *suppression* of urine and *retention* of urine. In suppression the secretion is suspended, which is a case coming under the care of a physician. Retention may occur from various cases requiring surgical aid. Sometimes after operations a difficulty may be experienced in emptying the bladder, and the nurse should lose no time in calling the surgeon's attention to this.

Sometimes the secretion from the kidneys is largely increased, and this condition is almost as dangerous as the suppression I have spoken of before.

This excessive quantity of urine is one of the distinguishing features of a disease you will often hear spoken of, *diabetes*, which is also accompanied by a singular change in the quality of the urine; it becomes loaded with sugar. A healthy person passes from one to four pints of urine in the twenty-four hours; but patients in diabetes have been known to pass forty pints in the same time, and even more than this. It will be the nurse's duty, besides, of course preserving a specimen of the urine for inspection, to measure it carefully for the physician's information.

Diabetes produces a gradual wasting away, and is a most painful disease to witness. Dryness of skin, and constant and distressing thirst, are accompaniments of it; and it is often very terrible to the nurse to restrain her patient's craving for the liquids which increase the malady. Great attention to the diet, from which sugar should be wholly excluded, is of benefit in such cases.

Another complaint of the kidney is known as Bright's disease, which is accompanied by the presence of albumen in the urine, which very often leads, though not always, to anarsarca, or dropsy. Sometimes dropsy comes from disease of the heart; but whatever may be the causes, it is a most distressing condition for the patient, and requires the utmost attention on the part of the nurse. The patient, when the dropsy appears in the abdomen, is restless and uncomfortable in al-

most every position, the feeling of distention amounting often to agony. Some relief is afforded occasionally by very gentle friction with the hand.

Of the operation which is sometimes performed for the relief of dropsy, paracentesis, or tapping, as it is called, I have spoken in another place.

CHAPTER XIII.

THE CIRCULATION OF THE BLOOD.

THE principle by which the blood is circulated throughout the entire frame is that of a force pump, by which the blood is driven, with successive strokes, through a series of elastic tubes. This engine is the heart, which is situated between the lungs, and lies obliquely towards the left side. It is somewhat the shape of a pyramid, and is about the size of the closed fist; the broad end, called the *base*, is turned upwards, the lower end, lying towards the left, the *apex*.

The whole is enclosed in a covering called *pericardium*, which is like a double bag, one layer of which is attached to the heart, while the outer layer is fixed for support to the diaphragm. The space between the layers is filled with a fluid similar to that contained in the peritoneum. The heart consists of four chambers, or properly speaking, muscular cavities, namely, the *right and left auricle*, and *right and left ventricle*. The right auricle and ventricle are divided from the

left auricle and ventricle by a thick muscular wall or partition extending from the base to the apex, whilst another but thinner division crosses and separates the auricle from the ventricle on either side. Communicating with these four chambers are four sets of tubes or conduits, leading to and from all parts of the body generally, and to and from the lungs specially. These are the *arteries* and *veins*. The capillaries are slender vessels or tubes forming a complete network between the arteries and veins ; so minute and general are they,

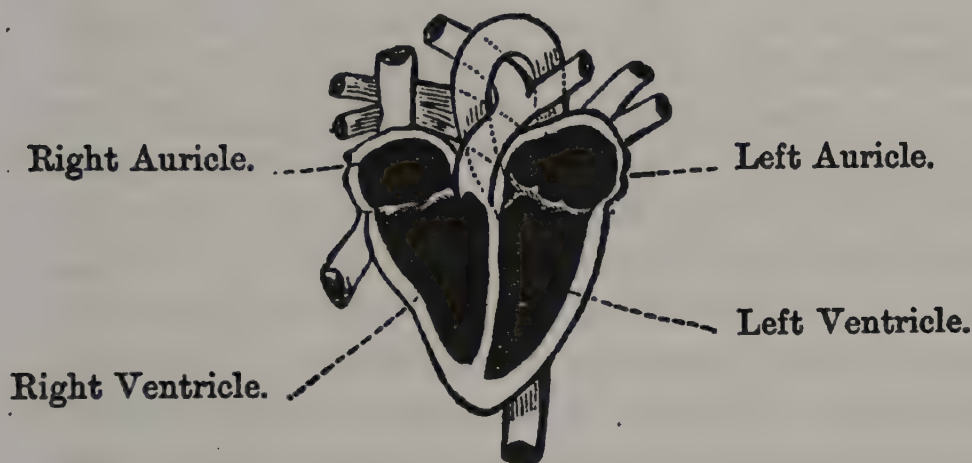


FIG. 1.

that it is impossible to prick the skin without penetrating them and drawing blood. From the capillaries arise the veins, which are tubes differing from the arteries in having thinner walls. There are also in the veins valves, which prevent the blood from returning to the capillaries, but allow it to pass on towards the heart. The muscular pressure to which most of the veins are subject, therefore, assists the progress of the blood in which it ought to go ; and it is in this way that exercise acts as a healthy stimulus to the circula-

tion. The principal deep-seated veins and the arteries follow much the same course, but there are, however, a superficial set of veins, and these are they which sometimes become *varicose*, that is, being unnaturally dilated, the valves cannot act.

The two great veins of the body, are the *vena cava, superior*, and the *vena cava, inferior*, the former receiving the impure blood through the smaller veins from the head and upper extremities for transference to the heart, whilst the latter receives that from the trunk and lower extremities. The heart is the pump or engine, which forces the venous blood to the lungs for purification. It is there acted upon by coming in contact with the external air breathed into the lungs. The arterialised or life-giving blood is propelled by the heart through the whole system for its nourishment. Communication between the auricles and ventricles are maintained by apertures or valves, through which the blood passes. The wall of the right ventricle is thinner than that at the left, from the simple reason that it has not the same propelling or forcing action to perform. The right and left auricle are alike in thickness, having the same object in view, that of receiving the blood and passing it on to the ventricle.

The *venæ cavæ*, you understand, are the channels by which the venous blood is collected from the body and carried to the heart, where it is first poured into the right auricle, from thence through the valve into the right ventricle. It next enters the *pulmonary arteries* for transmission to the right and left lung, where it is arterialised, and becomes, from being a dark red colour,

a bright scarlet. This being accomplished in the capillaries, the blood passes to the *pulmonary veins* back again to the heart into the left auricle, from whence it passes through the valve into the left ventricle, finally being distributed or pumped through the aorta to the whole body by the smaller arteries, and so on to the capillaries again.

All this wonderful movement is accomplished by muscular contraction. The contraction of a ventricle or auricle is called its systole ; whilst the relaxation is termed diastole.

The aorta and its branches, besides being surrounded by sheaths of cellular tissue and loose fat, are well protected, not only within the body, but even in the limbs, where the main arteries are placed on the inner side of the corresponding bones. The smaller branches of the arteries join frequently together, or *anastomose* as it is called, and by this means the supply of blood is equalised and insured against the effects of temporary pressure. Along the course of even small arteries the force of the heart's action is strongly exerted, and when one of these vessels is wounded the blood escapes by jets corresponding in rhythm with the pulse. In the finer of the arteries, though the stream is slower, at last becomes a continuous stream, like that of the veins and capillaries. You will find it useful to know a great deal more about the circulation of the blood than I am able to tell you, and I should advise you to read the very full and plain account of it in Mr Marshall's work,*

* A Description of the Human Body : its Structure and Functions. Illustrated by Nine Physiological Diagrams. Pub-

from which I venture to copy for your use the following valuable remarks :—

“ In case of an accident, or any escape of blood from a wound, you may distinguish without much difficulty whether it be venous or arterial. If it be venous the stream will be dark and continuous, and should be assisted by pressure upon the wound, and on the side of the wound away from the heart ; if arterial by pressure upon the wound and between it and the heart, for in the former case the stream which supplies the escaping blood is returning to, and in the latter is coming from that organ. In exceptional cases, or arterial *arches*, as in the palm of the hand, pressure must be applied mainly over the bleeding point. A small pad of linen held down by the thumb, is as useful and certain a method as any for an unskilled person.”

I should advise you to make yourself acquainted as soon as possible with the names and directions of the principal arteries, for such knowledge may sometimes prove invaluable even to a nurse.

It will be very useful also to practise yourself in feeling the pulse under different conditions. You ought to know well the condition of pulse usual in a state of health, of fever, of exhaustion. It may seem at first that such a thing falls only within the doctor's province, and no doubt the nicer distinctions of a pulse are only to be discerned by the doctor ; but a nurse who has accustomed herself to observation of the pulse, may by such experience be able to know when to go for the

lished by Alfred Jarrant, 11 Searle Street, Lincoln's Inn Fields, London.

doctor. In a healthy man you can generally count from 60 to 70 beats of the pulse in a minute, in a woman from 70 to 80. The pulses of children generally beat rather faster.

I do not know that it will ever come within your province as nurses to listen critically, as doctors do, to the sounds of a patient's heart, but it may interest you to learn that there are two, one which is called the systolic sound, and coincides with the contraction of the heart. This is the first sound, and barely precedes the beat of the pulse at the wrist. The other is the diastolic sound, and takes place the instant the heart returns to the condition it was in before the contraction. The first of these sounds is a dull noise, the other a shorter, smarter sound. The whole period from the beginning of one pulsation of the heart to the beginning of another, has been divided by some doctors into five equal parts, two going to the first sound, one to the second, and the remaining two to the interval of silence. This order of succession is called the *rhythm* of the heart, and when it is perverted it generally betokens the presence of some disease. There are a great many diseases of the heart, some arising from changes in its muscular texture, some from a change in its dimensions, others from changes to which the valves are subject.

I cannot go into these particularly ; but I must tell you, that you will often, as nurses, have to do with patients who think they have something the matter with their hearts, when perhaps the physician declares that they are free from any disease of the kind. Pal-

pitiation of the heart, and irregularity of the pulse, are often dependent upon some disordered condition of the stomach, and will cease at once when that is rectified. Besides this many nervous persons are subject to palpitations, and they are a constant attendant on some uterine disorders.

There are numerous surgical complaints arising from diseased veins, and the arteries are subject to one which I have no doubt you will often meet with, both in the medical and surgical wards. An aneurism is a tumour which consists of a preternatural dilatation of the artery. Sometimes an aneurism is occasioned by a wound, and is external ; in other cases it is internal, and occurs in the great vessels of the chest, abdomen, etc., and also in the heart. Aneurisms which surgical aid can reach, are treated in various ways—by compression, by ligature, etc. After the latter operation a patient will require a nurse's utmost watchfulness. He should be placed in bed with the limb in an easy position ; wrapped up in cotton wool to preserve its temperature, and though it becomes rather swelled, which is not unlikely, cold must on no account be applied. The application of a hot bottle, or other artificial means of producing heat, is extremely dangerous in such a case. The diet should be light and unstimulating, but nutritious. Bodily or mental excitement should be rigidly prevented by the nurse, who should do everything in her power to promote the perfect rest of her patient.

CHAPTER XIV.

THE ORGANS OF RESPIRATION.

WE have seen the manner in which the waste that takes place in the body is supplied. I will now say a few words as to the way in which the venous or impure blood becomes purified. This process takes place in the lungs, to the structure of which we must first give a little attention.

The lungs are contained in the thorax, as is also, you remember, the heart. You also remember that the walls of the chest, or thorax, are formed by the ribs, and that the muscles, which occupy the spaces between them, are called the *intercostals*. It is the contraction of these muscles which enlarges the chest, so as to allow of the in-drawing of the air, which act is called *inspiration*. It is their relaxation which forces the air out again, and accomplishes the *expiration*. The interior of the lungs consists of a vast number of exceedingly small sacs, called air-cells, each of which are covered by the terminations of minute arteries, capillaries, and veins, and thus at each beat of the heart the blood is brought into close relation with the external air.

The two lungs occupy nearly the whole of the thorax, and the form of each corresponds with each side of the chest, being conical with its base or broad part below. They are covered by a serous membrane, called the

pleura, which also lines the walls of the chest, much in the same way as the peritoneum does the abdominal cavity.

The external air reaches the lungs through the apertures of the mouth and nose, and proceeds downward through the larynx, which you will recall is in close connection with the pharynx. The tube through which the air

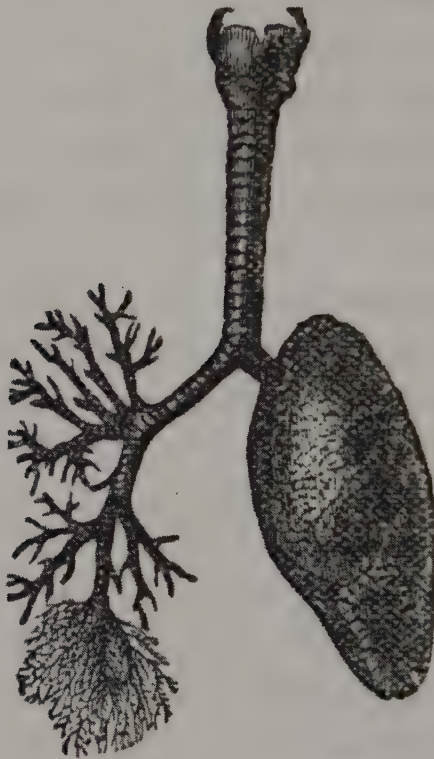


FIG. 2.

Diagram of Larynx, Trachea, and Bronchi. Left Lung shown attached.

passes, of which the larynx is a part only, is called the trachea; this divides into two branches, one for each lung; and these, the *bronchi*, again divide and subdivide till they finally terminate in the cells. When the lung is cut across, it appears and feels like a piece of sponge containing air and fluid mixed.

You know that the venous blood contains a large amount of carbonic acid gas. It is this, in fact, which renders it impure. By the act of expiration this is got rid of, and exchanged by the act of inspiration for air which will, when it reaches the blood, act chemically upon it, and render it pure—*oxidise* it, as it is called.

The whole act of breathing is known by the term *respiration*; and it is repeated in a healthy person fourteen or fifteen times every minute. You will often be required to note the respiration of patients; and, besides the frequency of the repetition, there are several other things which it will be well for you to remark. I quote again here from a valuable lecture of Mr Croft's :

“Some diseases are characterised by quick breathing, some by slow, some by very irregular breathing, some by a catching in inspiration, some by a long expiration. The breathing in some will be noisy, accompanied by a variety of sounds; and you should take note of those sounds. Have you ever heard the ‘*crowing*’ sound of affections of the voice tube? You will be very much struck by it whenever you hear it, and you will ever after associate it with the formidable disease of which it is the sign.

“You must distinguish the whoop of the whooping-cough; the whistling and squeaking sounds of specific disease of the voice tube; the peculiar wheezing sounds attending the asthmatic patient. You must have heard of stertorous breathing—breathing accompanied by *loud snoring* inspiration, and by flapping out of the cheeks in expiration. It is very alarming, denoting unconsciousness, insensibility from some cause. Listen for it in cases of apoplexy, and in cases of severe injury to the head, including the brain. If you ever hear similar breathing, *stertorous*, coming on *unexpectedly* in a case you are watching, be sure it is your duty at once to report what you

have observed. That breathing denotes that some important change has happened—that a case has taken a ‘turn,’ and for the worse. Now, if a nurse neglects to report a change of this sort, she is very much to blame. I beg you to remember this. In some cases the change from slow, steady breathing, like that of a person in deep natural sleep, is slow and gradual—*little by little* the breathing comes to be stertorous. A nurse may be excused for not recognising the exact time when the breathing became unnatural, but she will be culpable if she does not soon observe the change. I have known nurses say, ‘Oh, I supposed it was all right.’ I have been very suspicious that those nurses were asleep at their posts. Now you see, in this matter of the breathing the nurse’s observation becomes very important. She may, if she performs her duty properly, give timely warning of approaching danger. She may, by her carelessness or want of observation, fail to give that warning.

“The odour of breath is another subject for observation. Is it sweet, like chloroform or apples? is it spirituous? This should always be ascertained in cases of accidents or apoplexy. Is it foul, as in the case of gangrene of lung? Temperature of breath, whether hot or cool.”

The quantity of air taken in by the lungs in one hour amounts to 26,000 cubic inches; and, when you consider the manner in which it acts upon the blood, you will perceive how important it is that it should be pure and able to perform this function properly, and perhaps a few words on the principal change which occurs in the air by respiration will not be misplaced here. You know that arterialisation of the blood is effected by getting rid of the carbonic acid and taking in oxygen instead. In quite the same way does the air we breathe become deteriorated. It parts with oxygen and becomes instead carbonic acid. You must not

fancy that atmospheric air consists entirely of oxygen ; a very large proportion of it is nitrogen gas, which seems to be a sort of vehicle for the oxygen, and undergoes very little change of quantity by the act of breathing. It is, therefore, necessary that there should be always a sufficient supply of oxygen to replace the constant consumption of it which is going on. This subject of ventilation is one of the deepest interest to nurses ; but it has been so ably dealt with in most of the manuals on nursing, that I do not intend myself to enter upon it at length. I will only remind you that in the ward of a hospital there are many more sources of air deterioration than in private houses in general. All the emanations from the sick and all dressings give off gas of varying foetor, &c. Nevertheless, remember it is not necessary that the ward of a hospital should be close or ill ventilated. We were much gratified at St Thomas' Hospital by the assurance of the Princess Louis of Hesse—as we all know, a very competent judge—on entering one of the wards, that the air seemed as pure as that of her own bed-room.

But it does require some ingenuity and attention on the part of a nurse to keep a ward at the same time wholesome as regards the air, and of a proper temperature for the occupants. This is especially difficult in winter ; and though I would not for a moment be thought to countenance any want of ventilation, there is no doubt that in the large ward of a hospital there must be some slight individual sacrifice to the good of the many. The greater part of the patients are introduced, probably for the first time, into a perfectly

ventilated apartment ; and as the opening and shutting of the windows generally devolves on a probationer nurse, it is not the pleasantest part of her duty to the sick to combat their imperfect appreciation of the blessings of fresh air. They often grumble unnecessarily, but they do sometimes suffer, and that severely, from "general orders" as to windows, so, though it is not in your power, even if it were your wish, to reverse these orders, bestow on the sufferers in these cases a little of the consolation which goes so far to alleviate ills which must be endured.

It is possible to breathe highly impure air without being aware of it ; and it is more dangerous to inhale poisonous air in a very diluted form, and for a lengthened period, than to be exposed to it in a more concentrated form for a short period. It may possibly occur to you to have patients brought to you suffering from immersion in carbonic acid gas, perhaps by an accident to a sewer, or some such thing. These should be treated according to the directions given further on for the recovery of persons from drowning.

We will now turn our attention to a few of the disorders of the respiratory organs, which you will be likely to meet with.

There is a peculiar inflammatory condition of the larynx and trachea called croup, which is accompanied by a characteristic "*croupy*" sound, and the formation of a false membrane on the affected surface. This disease generally attacks children, and after having once had it, they are very liable to a recurrence of it. With the early stages of it hospital nurses have seldom

much to do ; it is only when the child's friends find their efforts for its relief unavailing, and become thoroughly alarmed, that they are willing to intrust their little one to the care of strangers. Then, alas ! it is often too late for help to be of much use. The breathing is seen to be laboured and difficult, the countenance troubled, and suffocation imminent. It is in such cases that the surgeon resorts to the operation of *Tracheotomy*, as the only means of affording relief. Tracheotomy is the operation of opening the trachea below the seat of mischief, the object being to allow a free passage of air to and from the lungs.

The nurse will be expected to keep the room at a very even temperature, from about 60° to 65°, being particularly careful not to allow her patient to breathe cold, dry air. This may be prevented by placing a kettle of boiling water on the fire, and attaching to the spout a tube, which serves to direct the steam into the room. In the opening which the surgeon makes into the trachea he inserts a silver tube, inside which is a smaller tube fitting it closely. This requires to be kept constantly clean and free from mucus, which has a tendency to lodge there. It must be taken out occasionally, and cleaned with a feather kept for the purpose. When replaced, a rag, or a bit of antiseptic gauze, wrung out of hot water, should be put over the aperture, to prevent cold air from getting directly to the lungs.

A patient's strength must be maintained by nourishing drinks, and the nurse should see that he is kept very quiet, and, if a child, happy and contented, as

irritable restlessness and crying will be most injurious.

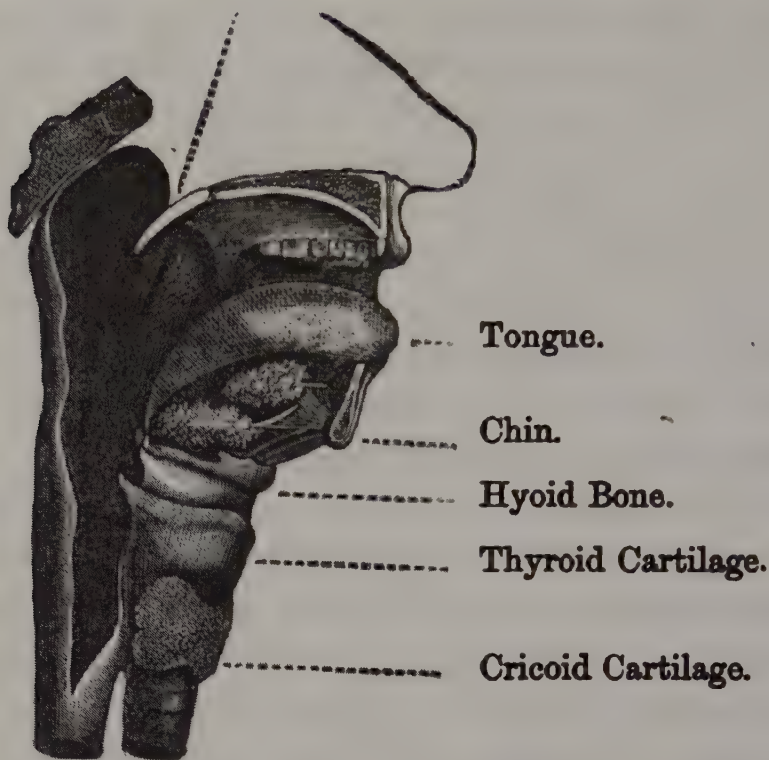


FIG. 4.

Section of Air-passages.

I must mention, by the way, that tracheotomy is performed for other diseases besides croup. In an adult, ulcerations and affections of a cancerous nature, or any serious obstruction to the breathing, often make the operation necessary.

The bronchial tubes are liable to an inflammation which is called bronchitis. Besides the remedies which lie within the province of the physician, there will be others which it will be the duty of the nurses to attend to. Poultices, constantly renewed, will probably be ordered ; and the inhaling of steam affords great relief.

Most hospitals are supplied with an apparatus proper for the latter purpose.

The character of the expectoration—*sputa* is the proper name for it—must be very carefully noted by the nurse, and specimens preserved for the inspection of the doctor. The expectoration changes very much in the different stages of bronchitis. At first it is transparent and adhesive; when poured from one vessel to another it draws out rather like melted glass. There is usually a good deal of froth and air-bells mixed with it, this depending on the degree of difficulty with which the mucus is coughed up. Sometimes at this stage the sputa are marked with streaks of blood.

When the inflammation begins to subside, the expectorated matter changes its appearance. It loses its transparency by degrees, and thick masses begin to appear in it of a yellow, white, or greenish colour. These masses, of which there are only a few at first, increase till the sputa consist wholly of them. Sometimes, when this condition is arrived at, the expectoration will suddenly assume its former appearance; and as this is generally an indication of the return or increase of the inflammation, you should lose no time in acquainting the doctor of it.

In a favourable case of bronchitis the disease generally begins to abate somewhere from the fourth to the eighth day of the disease; but if the symptoms do not yield to the treatment employed, signs of suffocation begin to appear. The lips, cheek, and tongue assume a purplish colour, delirium comes on, and rapid sinking, accompanied by cold, clammy sweats.

The patient is choked by the accumulation of mucus in the bronchial tubes, which he has not strength to cough up.

Pneumonia, or inflammation of the lungs, may extend to both lungs, or may be confined to one.

The usual symptoms are pain, more or less severe, on the affected side, dyspnoea, cough, fever, and a peculiar kind of expectoration.

In all diseases of the organs of respiration, the physician bases his opinion greatly on the examination he makes by means of percussion. With this you have as nurses little to do, except, I may say, that a physician generally prefers a patient to be in a sitting posture whilst he is percussing. Before the doctor examines a patient's chest, either by percussing or with the stethoscope, you should not forget to dry it carefully with a towel, which you should have ready, removing any poultice, etc., which may have been applied.

As in bronchitis, the nurse must be very particular in the inspection and preservation of the sputa. The cough is generally dry at first, and the first expectoration often resembles what you see in bronchitis, but it soon assumes a characteristic appearance. It is transparent and rust-coloured, and forms a jelly-like mass, which is so tenacious that you may even turn the vessel which contains it upside down without shaking it out. This is when the inflammation is at its height; if it subsides, the sputa become once more similar to bronchial mucus, but if it advances, the expectoration consists in many instances of a fluid something like gum water, of a brownish red or plum colour. I must tell

you that pneumonia is not *invariably* accompanied by this sort of expectoration ; indeed, sometimes there is none at all. In some fatal cases of pneumonia the patient will be unable to cough up any of the sputa at all, and will be suffocated by them.

Pleurisy is inflammation of the pleura, or the membrane which invests the lungs, and is often present with pneumonia, and is accompanied in some cases by an effusion into the sac. Sometimes the operation of tapping, or paracentesis, is had recourse to in order to relieve this, or the painful side will be covered with leeches or cupped. A blister is not often applied.

Bleeding from the lungs, or hæmoptysis, you will see very frequently ; it will require great vigilance on the part of the nurse, for the patient is necessarily unable to speak when the rush of blood comes. Whilst waiting for medical aid, you should administer ice in small quantities, and an ice-bag may be applied to the chest. Pulmonary consumption, or *phthisis*, is a change in the substance of the lung, commencing with a deposit of tubercles in them. Many and sad, I doubt not, will be the cases of this kind you will have to nurse. They are so often hopeless, as regards recovery, that they are most painful and trying. I have not space to speak of the numerous symptoms of this and other kindred diseases, but will only add that there is so much for a nurse to observe in all diseases connected with respiration, and so much that she can do to alleviate, if she cannot terminate her patient's sufferings, that I am sure no time that she can spend in study of the subject can be wasted. I am also sure that no

study, real and honest, and undertaken that you may know how to do your own modest, useful duties better, will make you conceited, so long as you never try to attract attention to what little you may have learned, or apply it for the purpose of making yourself of consequence to your fellow-nurses.

CHAPTER XV.

THE NERVOUS SYSTEM.

Whether your work lies in medical or surgical nursing, you will hear constant reference made to the nervous system, and the more you read about its functions the more you will be struck by the wonderful results which are achieved by the nerve centres and nerve cords, which have been often compared to a set of telegraph wires between the galvanic centre and the various distant points to which they are distributed.

The nerve centres, as they are called, where the mysterious nerve force—of the nature of which the wisest know but little—is generated, are composed of greyish cells, and the nerve tubes or fibres contain a whitish matter, and are packed in bundles for convenience of distribution to all parts of the body, though each runs its course separately from beginning to end. The nervous system has to do with sensation, muscular motion, the various functions connected with the nutrition of the frame, and all the manifold workings of

the brain. The nerve centres are divided anatomically into two divisions, cerebro-spinal and sympathetic.

The cerebro-spinal system consists of the brain, the spinal cord, and the nerves which proceed from them. As you know, the brain is contained in the skull, and the shape of one is moulded to the other. The spinal cord, which is contained in the spinal canal, finds its way into the brain through a large hole in the occipital bone, and is also covered by *dura mater*. Both brain and spinal cord are covered by a delicate membrane called *pia mater*, outside this is a double layer of a serous membrane called the *arachnoid*, and over this again is a thicker fibrous membrane called *dura mater*, which also separates the various parts of the brain from one another. The upper portion of the spinal cord is called the *medulla oblongata*, and is specially connected with the act of breathing. Any injury to this has always a fatal result.

The brain, as well as the spinal cord, is divided down the middle, and there is a special supply of nerve force for each side of the head, body, and limbs. The two hemispheres, as they are called, of the brain are connected by fibrous nerve bands, some of which are named commissures. The brain is also divided into a larger and smaller portion called the cerebrum or larger brain, and the cerebellum or smaller brain. It is the large size of the cerebral hemispheres in man which distinguish his brain from that of an animal, and it is supposed that there is an association between the higher faculties of the mind as well as the emotions, and the great cerebral mass which fills the upper part

of the skull. You will doubtless have an opportunity of seeing that not only in idiocy is there generally a defective development of this part of the brain, but also that any pressure, either through disease or injury upon it, may alter or destroy all power of the intellect.

The nerve cords, derived from the *cerebro-spinal* centre, are distributed throughout the body, often accompanying the large blood vessels, especially in the limbs. Some of these fibres or conductors convey impressions towards the centre, as those of sensation, and others impulses *from* it, as those of motion ; the former are called afferent fibres, the latter efferent. These nerve fibres may be also stimulated into action artificially ; thus, an electric current transmitted along a motor or efferent nerve, or even pinching it, produces contraction of the muscles it supplies, and mechanical imitation of a sensitive nerve causes pain. Use is sometimes made of this knowledge in stimulating the motor nerves of a paralysed limb by magnetism. When any part of the body is touched we know at once the exact spot ; and this is probably due in a measure to habit and education. At any rate, when a piece of skin is partially raised and turned round, as is sometimes done in surgery, to fill a gap made by injury, a considerable time elapses before the patient identifies its new position ; and those who have recently suffered amputation constantly complain of pain in the toes or fingers, which is explained by the irritation of the cut ends of the nerve fibres that supplied these parts.

Some nerves spring in pairs from the under part of the brain and medulla oblongata, and there are thirty-

one pair of spinal nerves which all have double roots, and escape from the spinal canal by the several holes in it and the sacral canal.

The sympathetic much resembles the cerebro-spinal system, but the centres or sources of nerve power are scattered instead of being altogether.

There is another important function of which the spinal cord is shown to be the special seat, that of receiving impressions, and communicating impulses quite independently of the will, and even, it may be, the knowledge of the individual.

This system, therefore, implies the presence of a centre of nerve power, and of afferent and efferent nerves, conveying impressions between such centre and the muscles influenced by it. This *reflex action*, as it is called, may occur without our consciousness, as in the case of the heart and intestines, or of the muscular ring which surrounds the pupil of the eye; or we may be conscious of it, though able to control it only partially or for a short time, as in swallowing and breathing.

The attribute of sensation is common to most parts of the body, and is therefore called *common sensation*. But there exists also the power of perception in other ways, viz., by the senses, and this is termed *specific sensation*. Common sensation is excited by mechanical or chemical irritants, but the appeal to the senses is made through special agencies. Each nerve of special sense has its particular centre or point of termination in the brain, and one cannot act in the place of another; each can fulfil its own special function alone.

Sensation, whether common or specific, may be par-

tially or completely suspended, either directly by injury to or pressure on the brain, or indirectly by the paralyzing influence of intoxicating agents on the stomach or lungs. All the machinery for producing an impression is complete, except that the brain is incapable of perception.

It is in this latter way that chloroform and other anæsthetics, as they are called, act. The intoxication, for such it is, thereby produced is transient; but patients often pass through the various stages of exhilaration before the period of stupor and insensibility ensues, and sickness, languor, and headache often succeed after sensibility is restored.

I need scarcely tell you the names of the special senses,—touch, taste, smell, hearing, and sight.

To the sense of touch I have already given as much space as I can afford when considering the structures of the skin, and I cannot say more of the organs of taste and smell than that the nerve centre in which the respective nerves terminate is endowed with the property of distinguishing flavours and odours. In the case of the tongue and palate the arrangement is of a nature closely allied to that which has been described as existing in the sense of touch.

The delicate organ of hearing consists of three divisions,—the external, middle, and internal. The first of these is that which we see on the side of the head, and the canal leading from it, into the orifice of which the finger may be passed; the middle compartment is the drum or *tympanum*; the inner one is called from its complexity the labyrinth.

The external ear is called the *auricle*, and the passage leading from it the *auditory canal*, which is lined

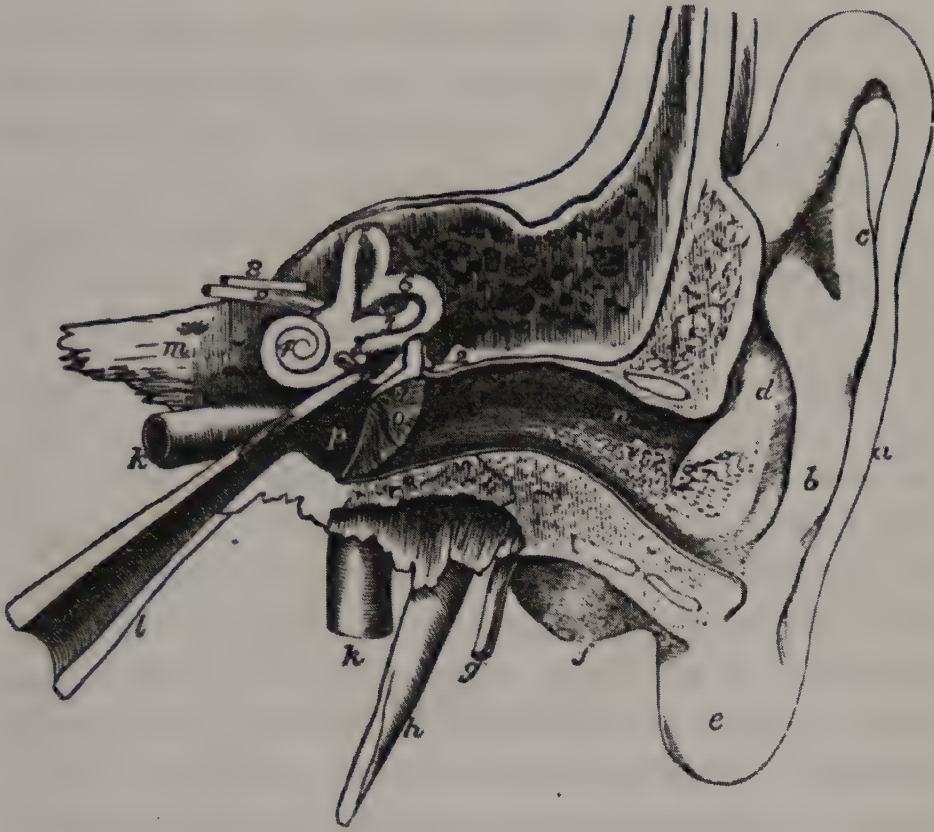


FIG. 5.—The Ear as seen in section.

a, helix; *b*, anti-tragus; *c*, anti-helix; *d*, concha; *e*, lobule; *f*, mastoid process; *g*, portia dura; *h*, styloid process; *k*, internal carotid artery; *l*, eustachian tube; *m*, tip of petrous process; *n*, external auditory meatus; *o*, membrani tympani; *p*, tympanum. 1 points to malleus; 2, to incus; 3, to stapes; 4, to cochlea; 5, 6, 7, the three semicircular canals; 8 and 9, portio dura and portio mollis.—(After Arnold.)

by a continuation of the skin inwards. It is protected from the intrusion of foreign bodies or of insects by the obliquity of its direction, by small hairs growing from

its surface, and by the presence of a bitter brown secretion called *cerumen* or ear wax, which is the product of special glands.

The middle ear or *tympanum* is a drum-like cavity, separated from the auditory canal by a fibrous membrane, which is attached to the whole rim of the passage, and completely shuts in the drum.

The interior of the drum communicates with a hollow cellular space in the bony prominence behind the ear. Air is contained in these, the *mastoid cells*; but the chief communication by which air has access to the drum to support its membrane is through a canal called the eustachian tube, which opens into the throat just behind the nostrils. The actual cause of hearing is the undulations of the atmosphere which are conveyed to the special nerve of hearing by the vibration of the membrane of the drum, which sets in motion a small chain of bones stretched across the tympanum or air chamber. But this drum membrane would fail to act, unless the atmospheric pressure on it were equalised by free communication with the air through the throat by means of the eustachian tube, which if obstructed, as in swelling or inflammation of the throat, fails to perform its office, and deafness ensues.

Diseases of the ear are usually treated by surgeons who devote their entire attention to that subject, and you will not in your ordinary course of practice as hospital nurses have much to do with them. I therefore refrain from entering into them. I would only advise extreme caution and gentleness if ever you are desired to syringe the ear, and that you should never

attempt that most difficult task of removing a foreign body unless you are far from surgical aid.

THE EYE.

As in the other senses, the nerve-centre is the organ of perception; and all the beautiful arrangement of lenses of different consistence, of muscular curtain, of pigment, and of tears is hereby subservient to the purpose of ensuring a ready transmission of light, and a

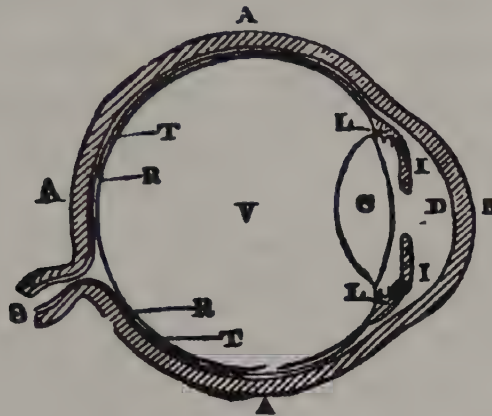


FIG. 6.

- A A A. Sclerotic membrane and conjunctiva.
- B. Cornea.
- C. Crystalline lens.
- D. Anterior chamber, containing the aqueous humour.
- I I. Iris.
- R R. Retina.
- T T. Choroid membrane.
- L L. Ciliary muscle.
- V. Vitreous humour.

true picture of external objects on the expanded nerve, the retina.

The orbit, in which the eye is lodged, is a conical cavity, its apex presenting the hole for the optic nerve

to enter. The globe of the eye, or eyeball, is in the form of a sphere, and the bulk of it consists of transparent humours, which are enclosed in membranes spread around them. The strongest of these membranes or coats is thick and fibrous, and constitutes the white opaque portion of the globe seen behind the dark centre. It is called the sclerotic coat, and has, continuous with it, and resembling a watch glass, the transparent *cornea* in front. The cornea is also fibrous in texture, but the arrangement of its component parts is such as to permit the free transmission of the rays of light. The various muscles moving the eye in different directions are inserted into the sclerotic near to the cornea.

The conjunctiva, a delicate secreting membrane, lines the lids and covers the sclerotic. It is turned back or reflected from the lids, so that nothing can pass behind it. The lids themselves are supported by cartilage plates, of which the upper is the deeper, and their edges are supplied with little glands, which keep them moist. A small delicate canal passes from the eyelid to a duct, which leads into the nose, and through which the tears are conveyed into the nostrils. The upper eyelid is raised by a special muscle, and a muscle surrounds both the lids, which closes the eye. The ducts of the tear gland open on the surface of the conjunctiva, and the little red fold of this membrane at the inner corner of the eye prevents the accumulation of particles of dust, and directs them on to the cheek.

On the inner or concave surface of the sclerotic coat the *choroid* is spread out, which is covered with pig-

ment cells and black pigment, and again within this is the transparent nervous expansion called the *retina*, consisting of both nerve cells and nerve fibres.

The conjunctiva is moistened by the tears derived from a gland which lies over the outside of the globe, and thus the movements of the eyelids and eye are facilitated, and the clearness of the cornea is preserved. The sclerotic gives form and support to the globe, and attachment to its muscles. The choroid absorbs the rays of light which are transmitted through the retina ; whilst the retina receives the images of external objects, and conveys the impression of them through the nerve to the brain. The cornea has partly the office of refracting as well of transmitting the rays of light. The bulk of the globe consists of the *vitreous humour*, which is soft and jelly-like in consistence, but really composed of a limpid fluid contained in the interspaces of a very delicate transparent membrane, which is disposed in intermediate layers. It occupies the space behind the lens, and allows of the ready transmission of light without much affecting its direction or concentration. The *crystalline lens* is imbedded in the front of the vitreous humour, in which position it is held by a strong and elastic ligament. It is perfectly transparent and convex on both sides, like an ordinary magnifying glass ; but more prominent behind than in front. It is arranged in several layers in a complex way, and becomes more dense as the centre is approached. Its structure, and the arrangement of its component parts, render it very elastic ; and its convexity diminishes, whilst its hardness increases, as age advances.

Between the lens and the cornea there is a considerable space, occupied by a transparent fluid called the aqueous humour, one of the purposes of which is to allow the perforated curtain within the eye to float and move at freedom.

This perforated curtain is called the *iris*, and the central aperture in it is named the *pupil*. The iris is a muscular structure, acting independently of the will, and varying in colour from light grey to nearly black. It is covered behind with a dark pigment to prevent light from passing through it. It is by means of the muscular fibres of the iris that the pupil is contracted or dilated, the iris acting under nerve influence.

Diseases of the eye, like those of the ear, are generally treated in hospitals, or at any rate in wards, specially set apart for the purpose; and in a work of this elementary description it would be impossible to speak of the vast numbers of disorders to which its several parts are liable. But whilst passing through the ordinary wards of a hospital you are very likely to meet with some of the various forms of ophthalmia, which is an inflammation of the eye, accompanied by a discharge of matter, and which arises from a number of causes into which I cannot enter here.

Your part as nurses will probably only consist of gently bathing the patients' eyes with the prescribed lotions, and perhaps syringing them, in doing which I must most earnestly advise you to use the utmost caution as regards your own safety, as some forms of this complaint are of a highly contagious character. Many a nurse has lost her eyesight through contact with the

discharge from the eyes of an ophthalmic patient. It is better not to employ sponges for bathing the eyes, but a bit of soft rag or lint, which should be instantly destroyed.

CHAPTER XVI.

THE SPINAL CORD.

The spinal cord is subject to many inflammatory and structural diseases ; but I can only mention one or two of those which are of most common occurrence, and in doing so I am going once more to avail myself of the lectures given by Mr Croft to the probationers at St Thomas' Hospital.

In *apoplexy* a person suddenly "falls in a fit," as if felled or struck down by a blow. The word is Greek, and is meant to express that. Seizure, and fit, and stroke, are the terms most commonly used. An apoplectic fit, or seizure, or stroke, a paralytic stroke.

There are three different modes of seizure, and you will see how one has got to be called paralytic stroke and another apoplectic fit, though the former is also apoplectic. In the first mode of seizure the person falls suddenly, deprived of sense and motion, and is like one in a deep sleep, with stertorous breathing, flushed face, full, slow pulse. Convulsions may occur on one or both sides.

In the second mode there is pain in the head, then

faintness, sickness, and paleness, slight loss of consciousness, perhaps the patient falls or slides to the ground as if faint. The headache continues, and he becomes gradually insensible, and more and more deeply so, and settles into a comatose state from which he rarely recovers.

In the third mode of seizure, with or without pain in the head, the use of one side is suddenly lost more or less completely. Consciousness is not lost ; but the power of feeling and moving more or less on one side of the body is lost. That is a paralytic stroke. It may become worse, and the person grow gradually unconscious and die ; or the same state may continue without getting worse, and it may slowly be recovered from ; or fit after fit may occur at intervals, and prove fatal at last.

Now, what can a nurse do in a case of apoplexy ? She can help both physician and patient in many ways. On receiving a case which she believes to be one of apoplectic seizure, or paralytic stroke, she should make certain inquiries of *the friends* ; first, whether the fit came on suddenly or gradually—whether with or without pain ; secondly, under what circumstances, during exercise, during employment, before or after meals, after drinking, after fasting for a long time—in the presence of companions, or if picked up alone—whether seen to fall by any one—whether he fell on a road, in a room, against anything, in a bed, backwards or forwards, and so on,—this sort of inquiry is to be made with a view of gathering information from friends whom the physician may never see ; thirdly, whether

any convulsions were observed, and if on one side only, or only part of one side. If convulsions occur, observe which limbs are affected, and in what manner—thumbs turned in and fingers clenched—arms drawn into side, or thrown out and about wildly ; the same of toes, feet, and legs. Notice particularly the face : if one side is drawn and the opposite side is blank in expression ; is saliva dribbling from the mouth ? Note if any foam is about the mouth. Observe the breath, whether it has the odour of spirits or beer. Enquire if any vomiting has occurred, and of what it consisted, food, drink, etc. Enquire whether the friends have given any brandy or stimulant, and what they have done. Observe whether there has been any involuntary evacuation of the bowels or bladder.

Treatment of a fit.—The nurse must not allow anything to be administered by the friends, not even salvolatile, or stimulant of any sort. Whilst the physician is coming, what is the nurse to do ? Having undressed the patient, and ascertained whether any scalp wound or superficial wound has been sustained in the fall (persons fall into the fire sometimes), she must arrange her patient in bed, the head and shoulders are to be raised, the dress is to be loosened, and no tight things left about the neck. She should wipe away anything—foam or remains of vomit—from about the lips and mouth, and clear away any obstruction to a free in-draught of air. She must remember that the patient is unconscious, and unable to swallow naturally. Apoplectic patients have been choked by fluids poured into the mouth by meddlesome friends or nurses. In-

deed they have been suffocated by their own vomit, the fluid has gone the wrong way and caused choking. No nourishment should be allowed at first ; but afterwards, in the treatment, the nurse must give the nourishment ordered (always of course fluid) very slowly and cautiously, in small quantities at a time. To go back to the fit—the nurse should take notice of any desire in any way expressed by the patient to pass water. If she finds no water has been passed, she must report to the medical attendant. Later on, if dribbling occurs, she must not mistake that state for the proper passage of plenty of water. The nurse must be prepared to have to give croton oil in drops, or calomel. The former is usually dropped on to sugar, and placed on the back of the tongue far back. The calomel powder must also be put far back on the tongue. This may be done with a spatula, thus : take up the calomel on the extreme end of the spatula, convey it into the well-opened mouth, and, when it has reached far back on the tongue, turn it upside down, and wipe off the calomel on the tongue. We will suppose the croton oil or the calomel in the back of the mouth. How is the person to be made to swallow it? Thus : pinch the nose and close the lips, and involuntary swallowing will take place. If this does not occur, the drug must be left to dissolve, and be absorbed from the mouth or gullet. Besides the purge, the nurse may expect to have to apply mustard plaisters to the calves of the legs and soles of the feet ; also to have to administer enemata, and to apply ice to the head. Every severe case of apoplexy is attended by *shock*. The nurse

must be cautious not to attempt to bring on reaction quickly, not to put hot bottles to the feet, to use hot blankets, stimulants, or anything of that nature. She must leave the physician to do what he thinks proper in that respect.

As to the course of the disease, I have only to say that the nurse must make use of her powers of observation, and report any changes to the medical man as they occur.

When a case of apoplexy is accompanied by *shock*, the face is pale and ghastly, the eyes are open and dull, one pupil is—or both are—dilated, face and body are covered with cold, clammy sweat, and the pulse is very small and weak. The respiration is occasionally *sighing*.

You may note that if a case which at first presented flushed face, staring eyes, full, strong pulse, and snoring breathing, becomes no better but seems weaker, and breaks out into profuse perspiration over the body, death may soon be expected; that cold sweat is the forerunner of death.

This seems a convenient time to speak of *coma*.

The term, which is Greek, means profound sleep—a state of sleep, with loss of consciousness, from which a person cannot be roused, or only transiently, and partly with difficulty. In strongly marked coma there is no power to perceive or to will anything; the limbs are like logs, they drop as if dead; the pupils are dilated, the eyeballs may be touched without causing winking or flinching; the breathing is stertorous; the secretions are passed without the patient's knowledge.

Coma may be brought on by disease directly, or may arise in the course of a disease which did not begin in the nervous system ; it may occur from injury which was not at first inflicted upon the nervous system. On seeing a case of *apoplexy* in a state of *coma* you will be puzzled, not once nor twice only, to distinguish it from *intoxication*, or poisoning by opium. Whenever you meet with a case which, in the absence of positive trustworthy information, may be one or the other, you must push inquiries as far as you can. You may elicit a history of taking poison or hard drinking from the friends or bearers of the patient. Try to elicit any facts or reliable intelligence about the case. Conjectures are not reliable. Smell the breath, and preserve and smell any vomited matters on the clothes, or any contents of the stomach rejected after you have taken charge. You may perhaps recognise intoxication by the slight unconsciousness of the person, and the nature of the response he may give, by the absence of stertor, or the slight degree of it, by the skin being warm and the pulse quick, by the pupils being equally contracted or dilated, by the general appearance which is sometimes suggestive, by the smell of spirits, by the history.

The coma arising from apoplexy I have already described. Particularly remember the pulse is slow and irregular, one pupil or both dilated, breathing stertorous and loud, complete unconsciousness.

In poisoning by *opium*, the patient can at first be roused by loud noises, the pulse is weak and soft, the pupils are very contracted and insensible to light or touch, the face pale and livid, and sweat bedews it.

You must learn to distinguish between paraplegia, which is usually understood to mean paralysis of the lower half of the body, and hemiplegia, a variety of the disease in which one side half of the body is deprived of sensation or motion, or both.

The nursing of paralytic cases requires great tenderness and patience on the part of the nurse, and much watchfulness too, lest the mere helplessness of her patient should give rise to bed-sores. But as there is not only loss of action and power in the voluntary muscles, but occasionally in the involuntary muscles, the excretions are often passed unconsciously, and all the precautions to which I have alluded when speaking of bed-sores before must be observed.

Tetanus is a very terrible affection of the nervous system, and is characterised by an involuntary, long-continued, violent cramp or spasm of the voluntary muscles of various parts, or of nearly the whole body.

Most cases of tetanus may be traced to one of two causes, which are exposure to cold, and some bodily injury. In the latter case it is called *traumatic* tetanus. Sometimes a very slight wound is sufficient to cause tetanus. I believe it is more frequent when the seat of the injury is the sole of the foot or the ball of the thumb.

In a fatal case of tetanus a patient generally dies on the second or third day; if he live to the ninth, his prospect of recovery is somewhat better. It is well for nurses to know the signs of the approach of tetanus, and its earliest symptoms.

The muscles that seem in general to be earliest

affected are those of the jaws, neck, and throat. A patient sometimes fancies that he has got a stiff neck ; he finds also that he cannot open his mouth as easily as usual ; after some hours he cannot open it at all. This is what we call *locked-jaw*. Other muscles now become affected. They are contracted by spasms, which extend to the muscles of the trunk, to the large muscles of the extremities, the muscles of the face, and last of all, in general, to the muscles of the tongue, and of the hands and fingers, which indeed sometimes remain moveable to the last, after all the rest have become fixed. These spasms are accompanied by excessive pain in the pit of the stomach, which seems to pierce through to the back, which is caused by contraction of the diaphragm, or great muscle concerned in the act of breathing. The contraction of the muscles of the face occasions a peculiar grin to be observed on the countenance, which is called *risus sardonicus*—the sardonic grin. In most cases the strong muscles of the back suffer greatest contraction ; and very often, during a paroxysm, the patient rests only upon his head and his heels, whilst his body is raised into the shape of an arch. These spasms or paroxysms occur about every ten minutes, and last for two or three minutes at a time, and then the muscles fall back into the state they were in before the spasm. When it is the strong muscles in front that are most contracted, the patient bends himself forwards till his head and knees come into contact. Each spasm begins usually with an increase of the pain felt in the pit of the stomach. Sometimes there seems to be no existing

cause for their return ; but sometimes it is evident that they are brought on by the slightest movement on the part of the patient, by the act of swallowing, or by any noise made by the attendants. As the disease advances the paroxysms become more frequent, and the shorter the interval between them the more alarming is the nature of the case. Tetanus is almost always accompanied by obstinate constipation, but there is no fever. The pulse and respiration are quickened, and a sweat frequently breaks out during the spasms from the pain and anxiety the patient then feels, but it does not occur in the intervals between the spasms. In the last stages of the fatal cases the pulse becomes quick and feeble, and the sweat is cold, as in other instances of approaching dissolution.

On the nurse will devolve the important duty of feeding the patient, which is a very difficult matter, not only on account of the closed state of the jaws, but from the danger there is in exciting a spasm. Food must be administered in a "feeder" with the greatest gentleness ; and the nurse must look out for a gap in the teeth where she may introduce the spout. Where none exists, it is sometimes found necessary to make one by breaking away a tooth, and occasionally nourishment is introduced by means of enemata. Whatever medicines may be given, there is no doubt that extreme quiet does as much and more for tetanus than anything else, and the nurse must never forget that though perfectly incapable of helping himself, her patient is sensible of all going on around him.

Another less formidable, but very unpleasant, disorder

to which the nervous system is liable is *Chorea*, or St Vitus' Dance. There is no loss of consciousness, and no fever, but there is an irregular and involuntary contraction of some of the muscles, which are not, however, wholly withdrawn from the government of the will. Chorea generally occurs in young girls from six to fifteen years of age, who are for the most part particularly sensitive, or what is called nervous.

The grotesque contortions of the muscles are not confined to those of the face, but extend to arms, legs, etc.

Fright is often a cause of chorea, and it is liable also to be propagated by a sort of contagious or rather of involuntary imitation.

In the treatment of chorea iron is often given, and great attention will have to be paid by the nurse to the state of the child's bowels, and if a shower-bath is ordered, it should be very carefully administered so as not to frighten her.

The presence of worms and the state of the secretions should also be carefully noted.

CHAPTER XVII.

MODES OF DEATH.

I think that it will be useful to you if I tell you something of the different ways in which people die, for I daresay it has occurred to you that these ways

vary considerably. Some people die instantaneously as it were, they seem to have been quite well one minute, and are dead the next; others die so slowly that we are unable to tell the exact moment that they pass from us. Some retain the full possession of their faculties to the very last, and others are unconscious to all around them for hours, or perhaps days, before they die.

You know that when the blood no longer circulates that life must cease, and an inquiry into the various modes of death really means an inquiry into the different ways in which the circulation of the blood may come to a standstill. I need not remind you that the respiration is entirely subservient to the circulation of the blood, and that the power by which both heart and lungs are worked and regulated belongs to the nervous system. Each of these systems must continue in action, or the circulation will stop and life will cease. The functions which these systems perform are called the vital functions, and the heart, the lungs, and the brain are called the vital organs. One cannot stop doing its work without the other two stopping very shortly. But the process of dying varies according to whichever of these organs it is which stops first.

First of all, there is a form of death which is caused by a want of the proper supply of blood to the heart. You see examples of this when people die of sudden and violent hæmorrhage, and you may have heard of cases in which death has been averted by the introduction into the veins of blood from a living person. Great pallor of lips and face attend this mode of dying, the proper name for which is death by anæmia. Cold

sweats, dimness of sight, a slow weak irregular pulse may also be observed. Sometimes there is vomiting, great restlessness, and some degree of delirium, and convulsions generally occur before death.

There is another form of death which begins at the heart, which is known by the name of *death by asthenia*. In this case there is no deficiency in the supply of blood to the heart, but the heart is unable to contract as it should do. This takes place in some cases of death by poison. Death by asthenia is also produced sometimes by some great stroke to the nervous system, by great grief, joy, or terror. Cases of fatal concussion of the brain, and certain kinds of apoplexy terminate in this way. A slow form of this kind of death is manifested in acute peritonitis, in malignant cholera, and in mortification. The pulse becomes very feeble and frequent, and there is great muscular debility, but the senses and hearing generally remain perfect to the last.

There is a state of suspended animation common to both these forms of dying which you will often hear talked about as *syncope* or fainting. Here is a simple failure in the circulation, and it will be useful to a nurse to know the effect of *position* in such a case. The best remedy for a fainting fit is to lay the patient flat upon the ground, or even to place his head rather lower than his body, in order that the current of blood towards the head may not be impeded by the force of gravity.

We come now to the way in which death is produced by the stopping of the breathing, or, in other words, by a want of the proper arterialization of the blood.

Death happens in two distinct ways here, in one case there is no air supplied to the lungs, in the other the power to use it ceases.

In the first instance, death is called dying by apnœa, or *asphyxia*, and may be produced in various ways—by smothering, drowning, choking, strangulation, etc.—in all of which ways the privation of air is sudden and complete. When death occurs by apnœa, there is at first a painful struggling for breath, to which succeed giddiness, loss of consciousness, and convulsions, after which all efforts cease, and the muscles become relaxed, but still the movements of the heart continue for a short time after all other signs of life are extinct.

Death in this way occurs in a space of two or three minutes, and the face is generally extremely flushed and swollen. It may be noticed in persons dying of bronchitis, in diseases of the heart and great blood-vessels, in pneumonia, etc.

I have already spoken to you of coma, so that you will have no difficulty in imagining what this form of dying is like. I will only add that the want of due arterialisation of blood in this case proceeds from the stopping of the muscular actions required in breathing in consequence of insensibility. When there is only a *suspension* of the nervous power which produces these muscular actions, death may be averted by means of what is called *artificial respiration*, which must be continued until the insensibility has passed away. Of this artificial respiration I have given you an account in another place. In most forms of apoplexy death occurs in the way of coma ; and many affections of the

twenty-first day ; hence the name by which you will sometimes hear it called, twenty-one day fever.

There are several things about enteric fever which call for the greatest watchfulness on the part of the nurse. First of all, the feeding of the patient, which will, as long as the temperature continues high, consist only of milk, beef tea, and such stimulants as the doctor may order. An adult will take a pint and a half of strong beef tea, and as much milk in the course of the twenty-four hours ; and if he is able to take this amount of nourishment, there is good hope of his ultimate recovery. A little should be given at a time, and nothing should be given hot, nor should the patient be permitted to raise himself in bed in order to take it ; but it should be given by means of a feeder, always remembering what I have told you before about the difficulty a person with a parched mouth and dry lips finds in taking anything into his mouth. When the patient is in a stupor, you should rouse him to give him food at the proper time ; but if he happens to be just having a little refreshing sleep, do not wake him up because it happens to be the exact minute for his beef-tea or milk.

You must be very particular that your patient always preserves a recumbent position. He must not be suffered to get out of bed for any purpose whatever ; and in making his bed, changing sheets, draw sheets, etc., should roll him gently from one side to another, and never allow him to sit up during the process. I have seen patients occasionally lifted bodily in their sheet and placed on the ground, or an adjacent bed, whilst

their own was being made. As far as I know, they were not injured thereby; but it is an unnecessary risk which a good nurse will always avoid. The reason why a patient with enteric fever should not be allowed to sit up is that a certain part of the intestinal canal is always in a more or less ulcerated state. Sitting up causes a strain and a pressure to be put on this which sometimes causes a perforation of the intestine. It is this state of the bowel which renders it imperative that you should rigorously forbid all food save that ordered by the doctor. In nursing patients in the general wards of a hospital in which enteric fever is often placed, this is occasionally very difficult, and it requires great vigilance to prevent good-natured fellow-patients, as well as visitors, doing much harm by indulging a fever patient with forbidden dainties. This is one of the cases in which it is quite worth while to take a little trouble in explaining *why* it is that you are so unkind as not to allow your patient to partake of the generally not very tempting luxuries offered. Patients recovering from enteric fever have often a ravenous appetite, but very little indiscretion in the matter of diet is sufficient to cause a relapse.

It will be necessary to use the greatest care to prevent bed-sores. I have already spoken so fully on this subject, that I need do no more here than remind you that cases in which the evacuations are constantly passed in bed, require more than ordinary vigilance. I must confess myself to a great prejudice in favour of beds filled with oat-straw for fever patients. They are not so unyielding as mattresses, and there is, conse-

quently, not the same continuous pressure on the more prominent parts of the body. They should be bags made of stout ticking, and filled by means of a slit, which should be left open, which will enable the nurse, by putting in her hand, to reduce all lumps and unevennesses with very little disturbance to her patient. A bed of this kind has also this great advantage, that the stuffing can be burned as soon as the patient is removed. I have seen the worst cases both of enteric and typhus fever recover on beds of this kind without there being even any redness of the skin. In all these cases whisky was diligently rubbed on to the back with the palm of the hand, and no *unnecessary* washing took place. I should tell you that pneumonia is a very common accompaniment to enteric fever, and that there is occasionally deafness.

Typhus fever is more sudden in its commencement than enteric fever. It generally sets in with a shivering fit, headache, sense of oppression, dulness, indisposition to move. It is mostly accompanied by constipation of the bowels, and the tongue, at the end of the first week, may be expected to be dry, rough, brown in the centre, and, in bad cases, it contracts into a ball, and is covered with dry, brown thick crust.

Some spots, more numerous than those in enteric fever, appear between the fifth and eighth days. These spots are in patches, irregular in shape, and of a dirty pink colour, not raised above the skin, or disappearing on pressure, except just at first. They do not come in successive crops like those in enteric fever, but last till the end of the fever, after the end of the third day

no new spots appearing. When spots contain blood, they are called *petechiæ*. The skin during the first week is hot, dry, pungent, and has a most peculiar smell, which no one, who has once remarked it, can forget. The urine is scanty, high-coloured, and has a fetid odour. The temperature may be expected to rise suddenly to about 104° , and to ascend till the fourth day, when it may probably be 105° ; and then a gradual decrease may be hoped for. The general character of the temperature is to rise and then slowly descend.

In typhus fever the more serious symptoms abate and diminish almost suddenly. Sometimes a patient seems worse just before he begins to get better, and sometimes a violent sweating attends the critical period. When once convalescence has commenced it goes on without the same fear of a relapse that accompanies enteric fever. The duration of typhus fever is about fourteen days, never exceeding twenty-one, and the second week has been usually observed to be most fatal. Delirium is nearly invariable, and the pupils of the eyes may be observed to be contracted. Typhus fever is often complicated by bronchitis, and there is nearly always deafness.

Much the same nourishment is required in typhus as in enteric fever, but there is not the same extreme caution necessary as regards diet during the convalescent stages of typhus.

SCARLET FEVER.

There are two striking features in scarlet fever, the affection of the throat, and the affection of the skin. Scarlet fever is divided, for convenience of description, into three varieties. I may as well tell you here that *scarlatina* is the proper Latin name for scarlet fever, and not a mild kind of it, as I believe some people fancy.

In *scarlatina simplex* there is little or no affection of the throat, but there is a red rash, with *scarlatina anginosa* both the skin and throat are affected; in the worst form of the disease, *scarlatina maligna*, the stress of the complaint falls on the throat.

Though children are more susceptible of scarlet fever than grown up persons, it is by no means confined to any particular age.

Scarlatina begins with shivering, langour, and headache, which is sometimes accompanied by delirium, and occasionally with nausea and vomiting. About the second day a rash comes out. This commences in minute points, which soon become so numerous and crowded that the surface appears to be universally red. The rash begins on the face, neck, and breast, and at last extends over every part of the skin. On the arms and legs it is sometimes rather different, having more of a *spotty* appearance.

In favourable cases this rash begins to fade and decline about the fourth day, becomes gradually indistinct, and disappearing mostly before the end of the seventh day. Then the skin begins to peel off—des-

quamation of the cuticle is the proper term for this. Scales of skin come off the face, and the scarf skin of the hands and feet comes off sometimes almost entire, so large are the flakes.

In *scarlatina maligna* the rash is apt to come out late and imperfectly, and instead of being bright to have a livid tint.

The tongue at the commencement of *scarlatina* is often covered with a thick, white, cream-like fur, the edges of the tongue are bright red, and through the white fur you can see the little prominences or papillæ red and enlarged. By-and-by these red points multiply, and the whole tongue becomes red, almost raw looking, and looks rather like a strawberry; but should the disease take an unfavourable turn, it will get dry and hard and brown, almost as it might in typhus fever.

Sore throat, with some stiffness of the neck, is one of the first symptoms of *scarlatina*, and on examination you will find that the tonsils and palate are of a deep red or even claret colour. By-and-by the tonsils become covered with whitish spots or grey crusts, and sometimes there is a great deal of ulceration.

There is a great variety in the severity of scarlet fever; some cases are so slight that the patient hardly feels it all, and others are so virulent that they prove fatal in a few hours. Death, in many instances, succeeds violent headache and coma.

The state of the throat is full of peril always, but of course varies considerably. It is apt to become foul and sloughy, the patient can sometimes hardly breathe

through the swollen nostrils, and the acrid discharge from these runs over the upper lip and makes it very sore. In fatal cases there is often immense swelling of the glands of the neck, which, with the stiffness, prevents a free return of the blood from the head, and produces a tendency to coma. Sometimes there is purging.

You may, perhaps, have heard of cases where patients have become permanently deaf from an attack of scarlet fever. This occurs from inflammation of the eustachian tube, which sometimes ends in the destruction of the tympanic membrane, and the little bones belonging to it.

However slight an attack of scarlet fever may be, there is always danger during the period of convalescence, and the commonest source of which is the kidneys. You will not have forgotten the functions of the skin, and can easily understand how, by the state of the skin in scarlatina, the escape of the fever poison through the outlet afforded by it is checked or prevented.

More of it is hurried through the smaller outlet of the kidneys, and this often gives rise to nephritis and dropsy. In very many cases of dropsy after scarlatina, you will find that it has been a very slight case, and that, through some carelessness of the nurse, or obstinacy of the patient, he has caught cold in leaving his bed or room, or has too soon given the secreting organs work to do which they were not able to accomplish unaided by the skin.

The approach of dropsy is often accompanied by languor and vomiting, and a confined state of the

bowels, and the urine is not only scanty but altered in appearance, and the face becomes pale and puffy.

With children there is frequently an attack of convulsions. When this occurs ~~you must be careful not~~ to allow the little patient's head to be at all raised above the body.

In scarlet fever you will probably be called upon to apply lotions to the inside of the throat by means of a syringe, if the patient is unable to use them as a gargle, and the throat will have in many cases to be cleansed by means of camel's-hair brush and a bit of lint. As convalescence approaches, warm baths will most likely be ordered in order to assist the peeling or desquaming process, and I need hardly say that the utmost care will be needed to guard against cold. When no symptoms of dropsy take place before the end of the fourth week, it may always be hoped that the patient may escape without this formidable sequel to scarlet fever.

In the very small space which I have at my command, I think it will be of very little use for me to talk to you at any length about small-pox. It begins very much as all other fevers do, with the exception that it is in the outset almost invariably accompanied by severe pain in the back and vomiting, and when these symptoms are violent they usually usher in a severe form of the disease. There are two kinds of small-pox. The milder sort, where the pustules or pimples are distinct, is called *discrete*; the severer form, where they coalesce, and their common outline becomes irregular, is called *confluent*.

You know that the fearful scourge of small-pox has much abated since the discovery of vaccination, so much so that it is extremely rare to meet a person now-a-days disfigured by it; but perhaps some of you do not know the difference between vaccination and inoculation, both of which terms I have no doubt you have frequently heard used.

Inoculation is the insertion beneath the cuticle of a healthy person of a minute quantity of the matter taken from a small-pox pustule. A person so inoculated contracts the disease, it is true, but does so in a much milder way than if it were taken in the *natural way*, as the saying is. Why this should be so is difficult to conjecture; but so the fact remains. Some say the Chinese discovered inoculation, others the Brahmins; but it was introduced into England from Turkey by an English lady in 1715, and the process became in a few years very general. Vaccination is the introduction, in the same way as inoculation, of matter taken from the udder of a cow suffering from a particular eruption. On the second or third day a pustule, similar to that of small-pox, forms on the place where the puncture took place, and about the eighth day there are some slight feverish symptoms, which soon subside, and this slight inconvenience has the effect, in most instances, of securing the person who has been subjected to it against an attack of small-pox. If such an attack does occur, it is generally in a modified form, and a fatal case is exceedingly rare when revaccination, at a proper interval, has been performed.

MEASLES.

The measles generally commences with the usual symptoms of fever, accompanied by the appearance of a severe cold in the head and a hoarse cough. The first day of the eruption the small red pimples are rather like those seen at the beginning of small-pox, but may be distinguished from them by containing no fluid. The rash begins about the fourth day, and soon has a blotchy look, the patches being somewhat of a horse-shoe shape, with the intermediate portions of skin of a natural colour. It takes two or three days to come out, beginning on the face, neck, and arms, then reaching the trunk of the body, and so travelling down to the lower extremities. It fades away in the same order, the skin not peeling off in the same way as it does in scarlet fever, but crumbling away in a fine branny powder. A nurse must use the same precautions against cold as are necessary in scarlatina, though danger to the lungs is what must be warded off in measles.

Chicken-pox is nearly always confined to children. It begins with very slight feverish symptoms, and the eruption is composed from the first of little transparent vesicles, which, when copious, gives the body the appearance of having been exposed to a momentary shower of boiling water, each drop of which had caused a tiny blister. Successive crops of these vesicles appear for two or three days, and whilst new ones form, the first begin to shrivel. When irritated by friction, they sometimes become so much inflamed as to be converted into pustules.

The scabs soon become gummy, then dry up and crumble off.

The treatment of chicken-pox is of the simplest kind, for it affects the general health in a very slight degree.

I shall speak in another place on the subject of disinfectants, and the difference between them and deodorants, both of which you will, you may be very sure, have to make use of in all cases of fever.

All fevers are more or less catching, as the phrase is, but they are so in different degrees.

It has been supposed by some that enteric fever is only communicable by means of the excreta of the patient, the poison from which may be either inspired or swallowed in drinking water, milk, etc. I will not venture to give an opinion on this point, but though many inmates of a house or neighbourhood may suffer from enteric fever, I do not think when the patient is removed to a hospital that there is much fear of the nurse in attendance taking it.

There is much greater risk in attending cases of typhus, which has been called the nurse and doctor fever, and which seems especially communicable by means of the breath and personal contact. In typhus fever age is no safeguard as it is to a certain degree in scarlet fever, which is catching in the same way that typhus fever is. The contagion of scarlet fever is not so strong perhaps as small-pox, but it is peculiarly subtle and tenacious. It lurks in rooms and clings to furniture and clothes, even after great care has been taken to purify them. It may even be sent in a letter, and there are some very sad instances of this on record.

You cannot be too careful as nurses in the precautions you use against conveying any of these diseases from your patients to the outer world.

This often requires some self-denial, but I am sure, with very little reflection, you will acknowledge that no social pleasure is worth the remorse which having been the means of occasioning suffering, and perhaps death, would cause you.

Whilst you are nursing fever cases, you must forego the pleasure of much communication with your friends, and on leaving the wards reserved for contagious diseases, you must be very careful to subject not only your dress, but all articles you may have used, such as books, papers, etc., and even your hair, to a thorough process of purification.

CHAPTER XIX.

THE INFLAMMATORY PROCESS.

In order that you may be able to nurse surgical cases intelligently you must in the first place have some idea of what is meant by inflammation.

Inflammation may be produced by a variety of causes, for example, a thorn in the finger, continued pressure on the hand, such as takes place in rowing for any length of time, or it may be occasioned by a severe blow, as you will often meet with in cases of railway accident. A certain amount of inflammation

is necessary in every wound in order that it may heal ; but this healthy inflammation may go on through stages which are no longer healthy.

There are four *signs* of inflammation, viz., pain, redness, heat, and swelling, and there are also four *stages* of it. These are, first, effusion, in which serum (the watery part of the blood), or pus, exudes. Secondly, suppuration, or the formation of matter. Thirdly, ulceration, which is the destruction of tissue or molecular death. Fourthly, gangrene, or death of the whole part.

It is quite possible for a mere swelling to go on to gangrene. You sometimes see examples of this when fractures are bandaged too tightly.

There are many theories as to the reason why an inflamed part looks red, and why serum should exude ; but all are agreed that it proceeds from some change which takes place in the blood vessels. The capillaries get so full of blood in an inflamed part, that the blood, not being able to proceed gets blocked up, and the circulation stops. Then presently there is a giving way of the tissues, and the blood, serum, and corpuscles exude.

Now we will return to the four *symptoms* of inflammation. First, the part is red. The capillaries get full of blood. Nevertheless I must tell you that some forms of inflammation are not red, but dark purple or dark brown ; this is where the blood is not properly arterialized—where it is venous. Secondly, the part is swelled, because there is too much blood. Thirdly, the pain is due to tension—matter forms and cannot

escape. Fourthly, the heat is first in the part affected, and then extends to the patient generally, and the temperature rises greatly. The reason that this elevation in the temperature takes place is, that the inflamed part acts on the system much in the same way that you have seen a small stove able to influence a long series of hot-houses with which it is connected by pipes.

Severe wounds and operations are often followed by what is known as surgical or inflammatory fever; and it will be well to consider the way in which this affects the patient's system generally.

With regard to the vascular system, we find the pulse raised perhaps 20 or 40 beats from the patient's normal one, often irregular, with a character of tension, a flushed face, and temperature elevated probably 4°.

The symptoms of disturbance of the nervous system are restlessness and general malaise, headache, wandering first in sleep, followed by delirium in the day, and coma.

The digestive system remains in abeyance. There is no appetite; and if food is taken in spite of this, it probably causes sickness and diarrhoea from being undigested. It is best for a nurse not to force or persuade a patient in such a case to take food.

Of the secreting and excreting organs, the skin and kidneys are most likely to be deranged. If the skin feel hot and dry, a nurse should endeavour to induce perspiration by the application of hot bottles, and may also administer a hot drink. If the kidneys cease to operate, blood poisoning may take place, and the patient may die in twenty-four hours. A hot poultice

over the lumbar regions may help to restore their functions. The tongue becomes rapidly coated, and eventually dry; and the last stages of inflammatory fever generally affect the nervous system.

In ordinary cases the fever will remit in course of time, and the patient get well.

Pyæmia is a terrible, but fortunately only an occasional termination to surgical cases.

In this disease the patient's chances of recovery are *much* less than in inflammatory fever. The first symptom is a rigor; but you must remember that a rigor is not invariably followed by pyæmia. It may be produced by ague, occasionally by urinary disturbance; but in a surgical ward a rigor is a very alarming thing. A rigor consists of a shiver followed by a perspiration. The patient will complain of cold, and yet to you he will feel very hot, his temperature will be high, and his pulse faint, small, and weak. The rigor lasts ten or fifteen minutes, and is followed by an intense and exhausting perspiration. An abscess will in all probability soon form in lung, liver, kidney, or joints. Perhaps within thirty-eight hours rigor No. 2 will take place, as bad as the first, then thirty-six hours another rigor, twenty-four hours another, and so on, occurring at gradually decreasing intervals. The breath has a peculiar odour like unripe sweet hay. The face has a saffron hue, and an anxious, drawn expression.

The only way to save the patient is to keep his strength up. If you can keep him alive the disease will in time wear itself out.

Pyæmia, or blood-poisoning, is due to the presence of pus in the blood.

You will often, not only in surgical but in medical wards, have to do with abscesses. You must always remember that the signs of matter having formed anywhere are swelling, throbbing pain, tenderness, *fluctuation*, and rigor. The safest thing a nurse can do in the case of an abscess is, immediately after a rigor takes place, to apply a hot poultice, as the application of heat, relaxing the tissues and blood-vessels, lessens the tension and greatly allays the pain.

The great majority of abscesses are better opened, especially where the matter is deep-seated or under fascia (the tense and strong membrane over the muscles), if it is underneath, and cannot get out, it is apt to burrow and go up the limb. Abscesses in the head, neck, or groin, are almost always in the lymphatic glands—matter forms in the centre and is bound in by a capsule—these are not often opened, but are generally treated by blistering. Sometimes they are incised.

After abscesses have been opened, it is a difficult and important question, how long to continue poulticing and fomenting them. As a rule, it may be done till the discharge loses its creamy consistency, becomes thin, and bleeds a little; if the edges become inverted, and granulations or proud flesh have begun, you have gone on too long.

An abscess, if not opened, will burst by the action of the pus scaling off the cuticle. An abscess which has not been opened or neglected, usually ends in *fistula* or *sinus*, and this occurs sometimes from too

long poulticing. We now come to the very important question of the manner in which wounds heal.

There are several ways in which wounds heal. The first of these is when they are said to do so by *absolute primary union*. This takes place when a cut is instantly put perfectly together, then every blood-vessel and lymphatic will heal in an hour. This is a possible case, but it happens very rarely.

Union by first intention, though the great aim of all surgeons in Britain, is, in France and other countries, thought so rare as not to be worth aiming at; but it is what may be expected to happen if the edges of a cut are brought carefully together and kept quiet. The following occurs in the successful healing of a wound by first intention. After the edges have been brought close together, a thin serous oozing takes place all along the track of the wound, this oozing is almost always stained with blood. In twenty-four hours this effusion becomes glairy, like glue, and, if not interfered with, what is called organisation and vascularisation takes place,—the vessels meet and prolongate into each other, passing from edge to edge and uniting. Contraction now takes place, and the wound becomes a thin line of fibrous tissue. This, however, is not true skin, and never will be, inasmuch as it contains neither sweat glands nor hair bulbs. It will be useful to you to know the mode of treatment likely to promote healing by first intention. Absolute cleanliness of the wound and of the edges which are brought close together,—no blood clots or sawdust from the bone must be allowed to intervene and separate the edges.

There must be no tension, to avoid which, a drainage tube is generally used, and an attempt is seldom made to heal the *whole* of a large wound by first intention, part of it being left for the insertion of a drainage tube. Rest is essential, and a good condition not only of the patient, but of the ward in which he is placed.

When healing by first intention is not possible, it is hoped that it may do so by *granulation*. A granulation is a loop of capillary covered over with an infinite number of epithelial cells, nourished with blood-vessels, and these grow till the whole surface of the wound is covered by them. When the edges or flaps of a wound are brought together, and it is allowed to heal by granulation, there is always a certain danger arising from the fact, that granulations do not grow on all tissues at same rate, those on the muscle and bone do so much more slowly, so that the wound healing more quickly on the outside it sometimes happens that an abscess forms in the interior. After a wound has granulated *cicatrization* takes place. This is the process of healing, and consists of a growth of epithelial cells thrown out from below. There are some wounds which never heal in this way, when it is necessary to have recourse to skin grafting.

This is what a healthy granulating wound should look like. The surface should be smooth, velvety, bright crimson in colour. It should be tender, but not painful; sometimes it bleeds a little. The edges should be level, —under certain circumstances they are faintly blue. The surrounding parts are soft and healthy. There is always a discharge of pus from a granulating wound,

which, when not too abundant and healthy, is of great value to it. Healthy pus should be of a creamy consistency, not fetid or ichorous, by which is understood pus containing broken up tissue.

The less interference a healthy granulating sore undergoes the better. It is generally treated with a water dressing, or ointment, which is perhaps to be preferred of the two, as it comes off more easily, and a water dressing continued for any length of time is apt to weaken the granulations.

ULCERS.

An ulcer is the result of ulceration, which is, as I told you, destruction of tissue. Mr Syme, the celebrated surgeon, used to divide ulcers into three classes, —1st, Sores prevented from healing by *deficiency of action*, as weak, callous, or indolent ulcers; 2nd, Sores prevented from healing by *excess of action*, as the irritable or inflamed ulcer; 3rd, Sores prevented from healing by peculiarity of action, which may be local, general, or constitutional. The first class of ulcer usually makes its appearance on old or weak people, whose occupation leads them to stand much on their feet. You will see in such a case the granulations protuberant, the edges will be frequently overhanging, cold and stiff. There will be a thin, watery, and excessive discharge, but no pain. The treatment of these ulcers usually consists in pressure and stimulation. The patient is kept in bed, and stimulating washes, such as gallic acid, nitrate of silver, black wash, etc., are applied.

In the callous or indolent ulcers, which come under the first class likewise, you will find no appearance of granulations. The edges are much raised and thickened, giving the sore the appearance of having been hollowed out. Some serum will exude, but very little discharge, and that of a bad fetid odour. These ulcers are often accompanied by disease of the kidneys, and occur chiefly in the labouring poor, who are exposed to the influence of cold and damp. They are best treated by being stimulated with blisters applied one after another till the edges are destroyed. There should be perfect rest, and a change of diet is also very desirable. The foetor arising from these ulcers may be overcome by carbolic acid lotion used by means of the spray, though as this is sometimes absorbed, and the kidneys affected by it, great attention should be paid to the state of the secretions.

The second class of ulcers, such as the irritable or inflamed ulcers which do not heal from excess of action, are generally on rich people, or those who live well, and are produced by good living and little exercise, and are more easy to treat than the former class. The patient is very irritable, and suffers an amount of pain quite disproportionate to the size and general appearance of the sore, which is not often larger than a fourpenny piece, and consists of a red spot without edges or granulations, which does not increase. The treatment of these ulcers consists mainly in outward applications, such as nitrate of silver, and great attention to general health, more particularly as regards diet, which should be the reverse of what it has hitherto been. These

inflamed ulcers sometimes lead to hospital gangrene, of which I will speak more presently.

The third class of ulcers may be divided into those where the peculiarity of action is local, such as varicose ulcers, and those where it is constitutional. When speaking of the circulation I alluded to the cause of varicose veins, so will only add here that the cause of the ulcer is the breaking up of a clot in the veins, which, suppurating and opening, forms a hole, which always heals with great difficulty. The patient should have entire rest, with the limb raised, and should wear an elastic stocking, or be carefully bandaged three times a day so as to give equal pressure.

Strumous or scrofulous ulcers are always running, and are generally situated about the glands of the neck, groin, and axilla, and wherever lymphatic glands exist, and are generally treated with iodine and stimulating applications, and an endeavour made to improve the general health.

I must caution you as nurses never to speak before a patient of scrofula or scrofulous sores, etc., as it implies a condition of health in which no permanent improvement can be expected ; and it being a word of which nearly every one understands the meaning, its use is calculated to cause extreme pain, whereas you will find it rare that a hospital patient knows what *strumous* means.

There are a great variety of constitutional ulcers into which it is not needful here to enter. The treatment consists usually in poulticing, free opening, and stimulants.

We come now to the last stage of inflammation,

gangrene, or visible death of the part affected. There are two kinds of gangrene. In *moist gangrene* the limb dies suddenly, with all its juices and life in it; in dry or senile gangrene it withers and shrivels up. If a line of demarcation form, it is a good sign, as it shows that the mischief has stopped. Nature generally removes the dead limb by a process of ulceration; but amputation is sometimes performed afterwards in order to obtain a better stump.

It is very important for a nurse to know how to distinguish between an extensive and livid bruise and gangrene. In both cases blebs or bullæ are apt to form; in a bruise these are full of pus or serum, and are fixed; in gangrene they are filled with air, and the whole cuticle having lost its adhesion to the cutis, they are moveable. Gangrene generally commences at the fingers or toes, and spreads up the limb with intense pain and fœtor. The coldness and numbness of the limb is also a distinguishing characteristic. In dry gangrene a patient may live for some time, as there is no absorption of poison as in moist. If the gangrene should proceed, as it sometimes does, from too tight bandaging, the bandages should be cut off at once, and the limb wrapped up in cotton wool. Equal temperature of limb, and equal circulation of patient should be aimed at. No stimulants should be administered at first, but the diet should consist of milk, rice, etc.

In cases of gangrene, the same precautions should be taken with regard to the isolation of the patient and the carrying of infection by nurses, etc., as have been advised in erysipelas and other infectious disorders.

OPERATIONS.

It greatly depends on the hospital in which a probationer is serving her apprenticeship whether it is her duty to attend in the theatre during operations.

In some it is only customary for the nurse of the ward to which the patient belongs to provide the necessary utensils, strapping, lint, oil, etc., for the theatre; in others this is not even required, the requisites for the theatre being always kept there. When they are provided by the ward, it is generally the duty of a probationer to collect them. The articles in use vary so much with the practice of the hospital, that I can only attempt to give you a general idea of what will be required for use during an operation, which is not to be conducted on antiseptic principles. At St Thomas' Hospital the following things used, in many of the wards to be placed in a large basket kept for the purpose, and carried down to the theatre a short time previously to the operation: basins, sand-bowl, bleeding cups, or porringers, as they are there called, strapping can, syringes, a bit of elastic tubing, stethoscope, feeder, tea-spoon, plenty of towels, a clean shirt in case the patient should require it, and a clean sheet and blanket, Mackintosh sheets, pillows, cotton, wool, tow, not forgetting thimble, scissors and needle, thread and pins. Besides these things, there was always soap for the use of the surgeon, bandages of various sizes, lint, strapping, or sticking plaister, cut into a fringe of proper widths, a bottle of collodion, olive and carbolic oils, and some ice and an ice-breaker.

It was then customary for the patient to be removed to the theatre on a stretcher, on which bed-clothes were arranged in the following manner: first a rug or quilt, then pillows and a sheet, which should be protected by Mackintoshes, on which the patient was placed and covered by a blanket and another rug.

The duty of a probationer in the theatre is generally confined to waiting on the head-nurse or sister, and in executing her wishes as deftly and with as little noise as possible. It is impossible to lay down rules for her guidance in circumstances which are perpetually varying, and the utmost that can be done is to advise her to make the best use of all her senses, and to try and attain the difficult mean between uselessness and officiousness.

In operations which are performed under chloroform or ether, sickness is a very constant accompaniment, both before and after the patient recovers consciousness, and a nurse should always have at hand some utensil, which may save the sheet, Mackintosh, etc., from being soiled.

I may remark that the nurse must carefully remove all dirty dressings, poultices, etc., before the patient is taken to the theatre; and a wound, after being thoroughly cleansed, should be covered with a bit of wet lint.

On returning from the theatre the patient, if still insensible, should be laid so that he can breathe freely, and attention must be paid to any chilliness he may experience; in many cases the application of hot-water bottles may be desirable. Occasionally a little brandy

is given if there is a tendency to faintness. I must not forget to tell you that, before any serious operation takes place, it is usual to administer an aperient to the patient the evening before, followed, if necessary, by an enema in the morning. An interval of not less than four hours should intervene between the last meal and an operation, but a little wine or brandy is often given a short time previously, especially if the patient evince much nervousness. After an operation a nurse must endeavour to save her patient all unnecessary exertion during the processes of bed-making, washing, etc.; and great attention will always be necessary with regard to the state of the temperature and of the secretions.

I need hardly say that the variety of operations that take place in the theatre of a hospital is immense. I can but name a very few to you of those which you will be most likely to meet with. You will often hear operations classified as major and minor, and your own sense will tell you that the former comprises all such as are serious, and may possibly prove fatal to life. Only such as these are usually operated on in the theatre; minor operations are generally performed in the ward. But all operations are attended by the same after-risk of erysipelas, blood-poisoning, and the like; and a nurse must never forget how quickly a very slight wound may progress to even a fatal termination.

If she sees a patient disinclined to take nourishment, unusually feverish, and most especially if there is a rigor, or even shivering, she should lose no time in calling the attention of the surgeon to him. One of

the principal operations which will come under your notice is amputation, a word signifying "cutting off." When spoken of as *primary*, it is implied that the operation has been performed forty-eight hours after an injury; *secondary*, when the operation has been delayed until the feverishness has subsided and suppuration begun.

An intelligent nurse will soon observe a difference between the symptoms, and consequently the treatment, of an amputation for injury and one for disease. Where an injury is received which makes an amputation necessary, the system receives a great shock; the reaction in such a case is apt to be violent, occasioning a high state of fever, during which hæmorrhage is likely enough to occur. This condition is succeeded probably by suppuration of the wound, and hæmorrhage from a different cause is again to be feared.

The surgeon will most likely order a low diet during the feverish stage, and a nourishing diet during the suppurative.

The case is different when the operation follows long disease. The system, having been reduced by suffering and prepared by dieting, instead of undergoing shock and reaction, is actually relieved by the removal of the diseased part, and return to health is the natural consequence. Feeding up in such a case may be at once resorted to.

After amputation of a limb, the leg and foot more particularly, patients will complain of the lost limb starting, and a sensation as though it were still there. To relieve this a sand-bag is sometimes laid across the

leg. Occasionally the leg is kept down by a broad bandage being fastened to either side of the bed ; but if time will allow, no more soothing plan can be adopted than that of the nurse gently laying her hand upon the limb from time to time. There are few things in a nurse's training more important for her to learn than the handling of a stump with dexterity. She should pass one hand under it firmly, yet with the utmost gentleness, placing the other on the top, gently pressing towards the flap. The stump must never be left without support.

The edges of the flap of a stump are connected by stitches, which in process of time are removed by the surgeon. It is very usual to insert a drainage tube to allow the free escape of the discharge ; and the first dressing of an amputation generally consists simply of lint dipped in carbolic or olive oil. It is then supported on a pillow. When, after a while, the edges of the flap are kept in position by strips of sticking-plaister, you must be careful not to place these exactly over the bone, and to vary their position from time to time. In removing the sticking-plaister, you must be sure to wash off the marks left by it ; and to do this you will often find it necessary to use a little sweet oil and turpentine. Be careful to pull the sticking-plaister off towards the edge of the flap and not backwards (as I have sometimes seen nurses do), and this not only for the sake of the wound, but because plaister, pulled against the direction in which the hairs grow, is very apt to make a sore place. In washing a stump, or indeed any wound, you must

be as carefully tender as possible, but remember it *must* be made clean.

All dried blood decomposes and becomes offensive, as does discharge from wounds. If it seems difficult to cleanse, it must be soaked and bathed with warm water. Sponges are now seldom used for these purposes in hospitals, small handfuls of cotton wool or tow being preferred, as they can be thrown away after the dressing is over, thus preventing all risk of infection.

There will always be a certain danger, after an amputation, of bleeding occurring, and a very careful watch for this will have to be kept up by the nurse, as she must remember that a patient will not call her attention to it, being in all probability unconscious of it. It will be some time before a nurse gets sufficient experience to enable her to make pressure on the main artery which supplies the wound; but she should try and use her little knowledge of anatomy to find out the exact spot, as many nurses have saved the lives of their patients by their acquaintance with such facts. Both in a case of this kind, and also any other of bleeding—such as that which proceeds from the rupture of a varicose vein—the limb should always be raised above the other part of the body.

An ice-bag is very often applied when there is bleeding, and should be suspended from the apparatus known as a cradle, or some similar contrivance, so as just to touch the wound and no more.

Though I do not purpose to enter into any of the diseases peculiar to women, the operation of ovariectomy

is one so constantly performed in all hospitals, that I must give you a brief account of it. Ovariectomy is the removal of the ovary for disease, and, in consequence of the locality of the diseased organ, one of the most critical operations which can be performed. Before it takes place, the surgeon will endeavour to get the patient in as good a condition of health as possible, by ordering a simple nourishing diet. A case of this kind is considered so important, that it is generally entrusted to two special nurses, one for day and one for night duty, and for this purpose probationers are often selected.

They will probably be expected to keep an accurate report on paper from hour to hour of the progress of the case, at any rate, during the first few days which succeed the operation.

At St Thomas' Hospital (and, I have no doubt, in others) nurses appointed to attend a case of this kind, were always expected before going on duty, besides paying the utmost attention to personal cleanliness, to put on perfectly fresh linen, and clean print gowns, aprons, etc., in order that the very slightest risk of infection of any sort might be avoided.

Immediately prior to the operation the nurse should see that both the bowels and bladder of her patient are emptied of their contents,—perhaps for the former purpose the safest plan being to administer a simple enema.

The temperature of the room should be raised to 65° or 70°, and the patient prepared in the usual way with flannel drawers and gown.

I need hardly say that, after the operation, the most

absolute rest of body and mind must be secured for the patient.

It will be the duty of the nurse to draw off the water from the bladder by means of the catheter, not less often than every six hours, being most careful when doing so, not to uncover the patient for fear of a chill. The bed-clothes should be so arranged that they open in the centre, by putting the folded blankets over the patient crossways. To prevent vomiting, if possible, is another great object, to effect which ice is often given, as well as iced milk or milk and lime-water.

Great care must be taken not to overload the stomach ; if fed by the mouth, small quantities should be given at short intervals.

For more information on this subject you cannot do better than refer to the book entitled "*Handbook for Nurses for the Sick*," by Miss Z. P. Veitch, in which is a most excellent account, full of valuable particulars, for the nurses' guidance.

There are a great many minor surgical operations which a nurse may not always be called upon to perform, but which she will find it most useful to know how to perform if occasion requires.

The surgical dressings in a ward are sometimes done by a nurse, and sometimes by a dresser ; and I am sorry to say there is every now and then a little uncomfortable feeling between them as to who has the best right to the privilege of doing so ; for as both dresser and nurse are students, a privilege it must always be considered. But as the former pays a great deal more highly for it than the other, I must say I

think he is more entitled to it, and a nurse should learn to consider it as a favour and not as a right when she has dressings at all confided to her.

But she will always be expected to wait on the dressers during the operation of dressing, and to bring them everything they may require for the purpose. This, of course, will vary with the practice of the hospital she is in. A clever and sharp-sighted woman will soon be able to remember where all the lotions, ointments, etc., in the ward are kept, and what are in daily use for each dressing. This is not a little puzzling at first, especially as there may be different things in use for almost each case.

These are some of the ordinary things used in dressing a wound which is discharging. A large, open, flat dish in which to place the dirty dressings removed—those in use in the Royal Infirmary at Edinburgh are most convenient, being so large that they may be placed on the bed without any danger of being upset; two basins, one containing warm water, to which probably some carbolic or other solution has been added, the second to hold under the wound whilst it is bathed, for a more horrid practice cannot be conceived than allowing the drippings from an impure wound to pass into what should be the pure water with which you are bathing it. A wound syringe is generally used to cleanse a wound, cotton wool, lint, and oiled paper will probably be wanted, and a suitable bandage. The dressing may consist of poultices, warm water dressings, or lint soaked in carbolised oil, or ointment spread on lint. The spreading of this ointment, when it is to

cover a large surface, requires some skill, and is only to be acquired by a good deal of practice. When wounds are dressed *antiseptically*, as it is called, they are always attended to by a dresser. As this method of treating surgical cases is daily meeting with wider appreciation, I think it will be well to give you some little idea of what it really means.

Antiseptic surgery is based upon the theory that putrefaction is due to the presence of microscopical particles in the air, in water, on the clothes, or on the hands, in fact upon everything that is not in itself antiseptic. It is thought that putrefaction is perhaps the greatest cause of mischief in open wounds, and by doing away with this fertile source of evil, pyæmia, blood poisoning, erysipelas, secondary hæmorrhage, and surgical fever may become almost unknown, or at any-rate vastly diminished in frequency in surgical cases. To obtain these results, however, great care must be taken. It is not enough that the antiseptic appliances so well known in the Edinburgh Royal Infirmary be *used*; but it is absolutely necessary that they be used efficiently and intelligently, and by those who are themselves believers in the theory on which this practice is grounded. This theory is that it is impossible for putrefaction to be generated in a wound to which germs have had no access; in other words, putrefaction must come from without.

The greatest care on the part of the surgeon will be useless if the nurse neglect the necessary precautions, which may be briefly stated as follows. In washing the patient care must be taken not to wet the dressing.

If the dressing get loose, or the patient uncomfortable, the surgeon ought to be informed at once. The nurse should not interfere in the way of putting her hand or cotton wool under the dressing, or indeed in any way, unless it be to put on an extra bandage in the case of the dressing being loose. If the dressing gets soiled with the fæces or urine let the part be soaked at once with carbolic lotion, 1 to 20 in strength, and perhaps a few folds of antiseptic gauze may be bandaged over the part as an additional precaution.

As antiseptic cases are, as a rule, only dressed when "discharge" shows itself, it is the nurse's duty to watch for it and inform the surgeon of its first appearance. All the antiseptic dressings should be kept in a tin box free from dirt or cotton wool, which, if it sticks to it, causes the dressing to be useless.

When an operation is to be performed antiseptically the nurse will find that the following articles will be usually required. Two bottles of carbolic lotion of different degrees of strength, 1·20 and 1·40; chloride of zinc, of the strength of 20 grains to the ounce; methylated spirit for the spray lamp. The sponges should be kept in carbolic lotion, 1·40, and not wrung out until just wanted. Though they are not often wanted, it is well to provide a bottle of boric lotion, and a bottle of carbolic oil, 1·20.

In the dressing basket there should be plain lint boric lint, pink mackintosh, green protective, carbolised gauze, and some thick soft muslin for a guard and for washing, as well as plenty of gauze bandages of all widths, and a box of safety pins.

The dressing is made of eight folds of gauze, with a bit of mackintosh between the seventh and eighth fold.

Of course there must be plenty of basins and solution pans, blankets and pillows, hot and cold water, just as would be prepared for an operation not performed antiseptically.

A nurse is sometimes required to prepare a patient beforehand by washing the part to be operated on well with 1·20 carbolic lotions, and wrapping a towel steeped in the same round it.

CHAPTER XX.

WARD DUTIES.

Tapping for dropsy is a minor surgical operation which you will often witness. Though occasionally performed whilst the patient is seated in a chair, it is more common to place him in a recumbent position in bed. A broad flannel bandage should be placed round the abdomen, with the ends crossed behind, and entrusted to two assistants who draw it gradually tighter, and thus support the abdomen as the fluid escapes. You will require for this operation a pail or bucket, which should be placed sufficiently near the bed to allow the indiarubber tube which is attached to the canula or instrument with which the incision is made to convey the fluid into it without any noise or splashing. The aper-

ture made will be closed with lint and plaster, and the surgeon will want a broad bandage, and perhaps some sheets of lint to use as a compress, in order to secure a proper amount of pressure on the wound. The patient must be carefully watched afterwards, so that any shivering or untoward symptoms may be at once detected.

CUPPING.

Cupping is the abstraction of blood from some particular spot by means of small glasses made for the purpose. After the glasses have been warmed, a bit of blotting paper soaked in spirits of wine is lighted and thrown into the glass, when it is allowed to burn for a few seconds, after which the glass is placed inverted on the spot, when a bladder will be seen to rise inside it. What is called the sarificator is now applied, and the glass reapplied as before. The glass may be easily removed by means of the thumb nail, taking care to detach the upper part first, that the blood may not run down. The glasses are to be applied in succession, but their position should be varied a little each time, in order that their edges may not press again on the same circle. Three or four ounces of blood are generally removed by each glass. The nurse must be careful to arrange towels or mackintoshes in such a manner that the patient's clothes may not be soiled, and the skin should be previously well sponged with hot water, and dried with a warm towel.

On a table placed conveniently near she must have ready besides the glasses, etc., spirits of wine, a lighted candle, blotting paper, and sponges.

BLISTERS.

Blisters are raised by either the application of blistering paper, or painting the part to be affected with blistering fluid. After the blister has risen it must be snipped with scissors at the lower part, and a vessel held underneath, that none of the fluid may escape on to the other part of the skin. Sometimes the nurse may be desired to cut round the whole of the bladder in order to keep the blister open. Afterwards it will be according to the doctor's orders covered with lint spread with some simple dressing, or poulticed.

Never apply a blister immediately over either the nipple or umbilicus.

FOMENTATIONS.

Fomentations are generally used to allay pain, and are very easily prepared and applied by means of a coarse flannel, which should be placed in a basin inside a stout linen roller and boiling water poured on it. The ends of the roller should then be twisted so as to squeeze out as much water as possible. When placed on the patient, the flannel should be covered with oiled silk or mackintosh.

LEECHES.

Nurses have endless receipts for making leeches bite, but I do not know that there is any better plan than to wash the part where they are to be applied perfectly clean, and dry it carefully. They may be laid one by one on the place, or placed in an inverted glass and

applied thus, and should be allowed to remain on till they fall off; the bites should be then either poulticed or fomented as ordered. If there is much bleeding, the doctor should be told at once, pressure with the finger being made in the meantime.

ENEMATA.

Mr Croft gives some excellent practical hints on this subject, which, as you may not all have the advantage of reading in the original, I shall transcribe for your benefit:

“Enemata are divided into classes in accordance with their actions—aperient, nutritive, astringent, sedative, and so on.

“When passing the tube of the syringe, whether you are about to administer the bulky aperient enema, or the small quantity of fluid forming any of the other injections, remember that you are to pass the tube just a little *upwards* through the orifice of the bowel (anus), then backwards and upwards in the course of the bowel (rectum).

“An inexperienced nurse is pretty sure to push the tube only in the direction upwards, and to meet with failure therefore. The passage of the tube causes pain, and the injection returns as it is pumped in. The syringe should be filled before the tube is introduced, otherwise air will be forced in before the enema. It is a mistake to inject nutrient enemata made of several nutritious fluids, thickened with gruel or arrow-root. The rectum is incapable of digesting things, and is not possessed of the powers of a stomach. Nutritive

enemata should consist of thin solutions of such materials as can be absorbed directly by the lining membrane of the rectum. Thin beef-tea forms an excellent nutritive enema. It should be injected in small quantities not exceeding two ounces at a time, and may be repeated about every four hours. Astringent enemata should be injected in small quantities and slowly."

THE USE OF THE CATHETER.

You will probably be required, in the case of female patients, to introduce the catheter for the purpose of withdrawing the water from the bladder, when any obstacle prevents this being done in the usual way.

This is one of the things it is impossible to teach by means of a book. You can only learn by practical experience how to perform this necessary office, which should be done, if possible, with a gum elastic catheter instead of a silver one.

BANDAGES.

It may safely also be affirmed with regard to bandaging, that no amount of teaching is of the slightest avail without practice. In many hospitals the nurses have access to a dummy, or at least an artificial leg, on which they can exercise themselves in an art so useful; but this failing them, they must avail themselves of every opportunity of practising on each other. It has been said that no nurse should be satisfied with her proficiency till she can bandage a cannon ball without a gap or wrinkle. So it will be well for you to aim at

least at this amount of perfection. Place an illustrated book on bandaging (there are several) before you, and try patiently over and over again, not being disheartened by many abortive attempts. Bandages usually consist of strips of linen, calico, or flannel, varying in breadth from one to three, five, or more inches, and in length from one to six, eight, or twelve yards. They are rolled up longitudinally for use, and hence have received the name of *rollers*. Besides the simple rollers there are many compound bandages, such as the **T** bandage, etc., of the names and uses of which I should advise you to make yourself acquainted as quickly as possible.

POULTICES.

The poultice most in use in hospitals is linseed meal. Sometimes a linseed poultice is spread on paper, oftener upon linen or tow. Tow is an excellent thing to keep the heat in, and should be pulled out till it is perfectly even and fine, and free from knotted masses. The paste should be made in a basin *heated first with hot water*. After throwing this away, the nurse should pour in sufficient boiling water for the poultice, and then gradually add the meal, stirring it well the whole time. A long knife called a spatula is generally used for the purpose of working it about till it is light and free from all stickiness, and then spreading it on the linen or tow. This should be done very evenly, and occasionally it is well to add a little olive oil.

Mustard poultices are either made of mustard entirely, when they should be mixed with boiling water

and spread on paper with a layer of muslin to protect the skin, or the mustard may be mixed with linseed and made as above directed.

Bread poultices are made by pouring boiling water on to some stale white bread crumbs. A plate should be placed over the basin, which should be allowed to stand for a short time. The water should then be drained away, and the poultice poured into a muslin bag ready to receive it.

Charcoal is frequently added to both linseed and bread poultices. About a quarter of an ounce is sufficient to sprinkle over the surface of the poultice.

BATHS.

You will be expected to give baths to your female patients, and the following table of temperatures for baths may be useful to you.

Cool,	.	.	65° — 75°	Fahrenheit.
Temperate,	.	.	75° — 85°	"
Tepid,	.	.	85° — 95°	"
Warm,	.	.	95° — 100°	"
Hot,	.	.	100° — 112°	"

A special apparatus is provided for hot air and vapour baths. That for the former generally consists of a wicker-work cradle placed over the patient, who should be lying in bed on a blanket, but with nothing over her. Blankets must then be placed over the apparatus, and arranged so as to cover the patient's neck closely in, but not her face, a passage being also allowed for the chimney of the apparatus, which now

forms a chamber which is presently filled with hot air by a pipe connected with a small moveable stove. The object of this is to promote the free action of the skin. Sometimes these baths are medicated with sulphur, soda, or mercury. Some hospitals are provided with Turkish baths. In these the process consists in the patient, after free perspiration in an apartment of carefully regulated heat, undergoing the operation of shampooing, which is followed by a douche of tepid or cold water, and a gradual cooling down in a well-ventilated room.

HYPODERMIC INJECTIONS.

You may often be required to administer hypodermic or subcutaneous injections, chiefly for the purpose of relieving pain or producing sleep. The injection usually consists of a solution of morphia. The pump-like part of the little instrument which is used for the purpose is marked with numbers, which enable you to give with the greatest nicety the number of minims ordered. As the strength of solutions of morphia is variable, it is no use telling you the number of drops for an ordinary injection. The part of the body usually selected for these injections is the arm, though it depends somewhat on the seat of the pain. Sometimes in affections of the eye the temple is chosen. The injection should enter under the skin, into the layer of fat immediately beneath it. You should dip the needle in oil, and prick the skin firmly, not burrow it in, as I have seen nurses do, thereby causing great pain, and (if they work it *along* the skin), great danger of an abscess,

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SPLINTS.

It will be very useful to you to make yourself acquainted as soon as possible with the names of the various *splints* used in surgical cases. These vary so that it is impossible even to say anything about them. Neither do I see much use in taking up your time with any remarks on the way of padding them. In some hospitals this is a most elaborate proceeding, and one in which the nurses take great pride. In others the padding is done in the roughest way; but I daresay effects the intention quite as well as the other. The same thing holds good with regard to the putting on of splints, which by some surgeons will be bandaged with infinite care, whilst others are content with a far more rough and ready but equally efficacious process. But these are exactly the things which you come to an hospital to learn, and on which theoretical teaching is of little value.

A constant habit of attention to what is going on around you is what you should cultivate, though I should not advise you to weary out the patience of the staff nurses with whom you may be placed by wearisome and incessant questions.

You will occasionally, even as a probationer, be left in charge of wards where you will be expected to receive any cases of accident which may happen to be taken in. In an accident ward there are always some beds kept prepared for any case of the kind, with the bed-clothes protected from being soiled by blood, etc., by a mackintosh sheet laid over them. After the patient has been

placed on the bed by the porters, and the screen drawn round, you will be expected to perform the operation of washing in most cases, though I have known instances in which nurses have adhered too rigorously to this general order of cleanliness, and in which it would have been better to allow the unfortunate sufferer a little time to recover the shock to which he had been probably subjected.

Females who have sustained some perhaps slight injury are often brought into a hospital suffering from an hysterical fit; and both men and women are constantly brought in suffering from accidents as well as from drunkenness and delirium. It is not every nurse who has the gift of managing such troublesome patients; many are extremely timid when called upon to deal with them; but however frightened such a one may be, I should advise her most earnestly not to show that she is so. Neither contradict or argue with persons who are not in their senses, but treat them with mild firmness.

The difference between drunkenness and a fit is such as to puzzle experienced medical men often, so I am sure it does not become me to enter upon it; but it may be useful to you to know how to distinguish between a fit of epilepsy and hysteria, though this is not easy.

The chief differences are, that in epilepsy a patient generally knows beforehand when a fit is going to take place—an *aura* her peculiar sensations are called; in hysteria there is seldom any warning. She frequently, in falling down in an epileptic fit, hurts herself by

knocking against something, whereas an hysterical patient seldom does this, but nevertheless cries and makes a great deal of fuss ; yet she cannot bear to have her eyes touched, which an epileptic patient will allow you to do just as if she was under the influence of chloroform. Also, during the fit, the patient passes fæces or urine involuntarily in epilepsy, but not in hysteria. .

Hysterical patients want firm but kind treatment, and if a nurse once manages to obtain a certain amount of moral ascendancy over them, she may do a great deal towards cure.

Hysteria is a constant accompaniment of uterine disorder, but is very largely developed by want of self-discipline and control on the part of the patient. It should be checked as soon as possible in a ward, for it goes from one female patient to another, and in a very short space of time you may have the whole ward in a state of commotion with it.

I do not think I need further urge on you the importance of intelligent and accurate observation of the sick. I am sure you are all convinced of this ; but after you have been *some time* in an hospital you will discover how impossible it is for ignorant nurses to give a reliable account of the symptoms exhibited by a patient. Nothing but constant practice and experience can do you any good in this matter. -

It may possibly be the practice of the hospital you are in for the probationers to take notes of some of the cases. I am quite sure such a habit would conduce to most valuable development of the power of observation

if it were maintained by the nurses; but whether the information which a raw probationer acquires compensates for the time bestowed on copying and elaborating notes of doubtful accuracy, I will not venture an opinion.

The lectures to which probationers in most hospitals have the privilege of attending are of great value. The clinical lectures which are often given for the benefit of nurses are, I think, of the *greatest* use to them.

It is constant attention to these, observing how the remarks made on the symptoms and state of the patient corroborate or contradict those you have yourself made, which will, with your own experience, enable you, by-and-by, to take notes of cases which shall be of more value than waste-paper.

I will give you a few of the symptoms which you will be expected to observe.

Sleep.—How many hours, whether continuous or broken, and the character of the sleep.

Food.—Quality of food taken, also the amount of stimulant, whether the food is eaten with any degree of appetite, whether eating is followed by sickness or any other symptoms. She should also notice what kind of appetite the patient has, and if he experiences thirst, and craving for any particular sort of liquid.

Pulse.—I have spoken to you already about the pulse, so will only advise you to make yourself acquainted with the different states of the pulse in health, in fever, in exhaustion, etc.

Temperature.—To ascertain the state of the patient's

temperature will be a duty you will constantly have to perform. The thermometer should be placed in the armpit, unless you have distinct orders to the contrary, and you should not leave it in less than five minutes. The time of taking it, which should be at regular intervals, should be carefully recorded. The average temperature of a healthy person is 98.4° . Temperature over 100° indicates fever, over 106° is generally the forerunner of a fatal termination to the case.

Skin.—Is it warm, cold, cool, moist, or dry?

Respiration.—I have already spoken of, and I need hardly say that every particular of a cough, including the expectoration, should be most carefully noted, and the same thing may be remarked of all vomited matter.

Bowels.—Frequency and character of fæces should be observed; and you should learn to recognise the stools characteristic of different diseases.

Urine.—You will constantly be required to measure this. The average quantity passed by an adult is fifty ounces. It may happen that you are called on to test urine; at any rate it may be useful to you to know how to do so. Testing means the process of finding out the precise unhealthy or unusual quality in the urine. The test of heat is usually applied by placing a small quantity of urine in a test tube, and subjecting it very carefully to the influence of a spirit-lamp.

To test urine in order to discover if there is *bile* in it, a little must be poured on a white plate, and nitric acid added to it drop by drop. If bile is there it will produce a play of colours from brown to green, blue, violet, and red—characteristic of bile pigment.

To detect *albumen*, two tests are necessary—heat and nitric acid. On boiling albuminous urine in a clean test-tube, the albumen coagulates and produces a cloud varying in density. There are conditions, however, into which it is needless here to enter, under which heat alone is insufficient to detect albumen; some drops of nitric acid should therefore always be added, either before or after the urine is subjected to the boiling process.

There are many other tests for discovering the presence of phosphates—lithic acid, grape sugar, etc.—in urine; and when you have time enough at your command, you will find some little experiments on the subject very interesting; but I do not know, as nurses, you will ever be able to make much practical use of the information you may acquire.

Not that I would, however, discourage you from any investigation or inquiry which may serve to make your beautiful work of nursing more interesting to you.

CHAPTER XXI.

SICK COOKERY.

Beef Tea.

Whenever you have it in your power give your patients beef-tea made from fresh beef, and not made with some of the many preparations now so much used. 1 lb. of beef will make $\frac{3}{4}$ of a pint of really good beef-

tea and no more. You can dilute it, of course, if you please.

Patients who are on "beef-tea diet" ought to have generally $\frac{1}{2}$ lb. of beef made into tea, and 3 pints of good milk daily. Sometimes to this there may be added eggs.

The simplest and best way of making beef-tea is to cut the beef into very small pieces, strew a little, not too much salt over it, and placing it in a covered jar, allow it to simmer gently for about four hours. Let it be quite cold, and you will then be able to take the fat off easily, and can warm up the beef-tea in small quantities as you require it.

Egg Flip.

The ordinary hospital way of making this is first to thoroughly beat up an egg with a little sugar, and gradually add a half pint of new milk, beating all the while till there is a nice froth on it. It is a good way of using the wine or brandy ordered for the patient to put some of it into this mixture. If it is desired warm, a little warm water must be added very carefully, for fear of the milk and egg curdling.

Egg Pudding.

Beat an egg thoroughly with a little sugar, and pour it into a large saucer or half pint mug, and fill up with milk. You may either tie a bit of muslin over it and boil it, or bake it.

Barley Water.

Wash 2 oz. of pearl barley, and boil for twenty minutes in a pint and a half of water, flavour with a little lemon peel and sugar, and strain it off.

Lemonade.

One lemon will make one pint of lemonade ; pare the lemon, and cut it into thin slices ; add the water boiling hot, with sugar to taste.

Mince.

This is a good way of making the allowance of meat sent up from the hospital kitchen more palatable to a fastidious patient. Mince the meat up finely, and add to it a little beef-tea, thickening it with a very little flour, and flavouring it with salt and pepper. Stir it gently in a saucepan till quite hot ; or, if it is preferred, you can put the mince into a plate and cover the top with some finely crumbled bread, and brown it in the oven.

CHAPTER XXII.

DISINFECTANTS.

You will very often hear the term "disinfectant" made use of, and in so many senses that it is very probable that you will get an extremely confused idea into your mind of what it really means. The word

disinfectant should only be used when speaking of the substances which can prevent infectious diseases from spreading, by destroying their specific poisons.

Do not confuse disinfectants with antiseptics, which are agents preventive of putrefaction, or with deodorants, which remove smells without necessarily destroying any hurtful matter. A great many presumed antiseptics and deodorants are in use at the present time. Of the efficacy of these I will not presume to speak, but I believe it is acknowledged that some of them have been much over-rated.

Carbolic acid is greatly used as both an antiseptic and deodorant. In the form of a solution, you will be accustomed to employ it in surgical dressings, etc., and as a powder it is very valuable as a means of overpowering the smell, and arresting putrefaction of the contents of night-stools and bed-pans.

There are certain diseases which are supposed to be spread abroad by means of what is known as *contagia*; and the nature of this contagium or poison has given, and still gives, rise to a great deal of discussion, upon which it is not necessary for us, as nurses, to enter. It concerns us more nearly to know the manner in which contagion may be spread, and the best means which we can use to prevent it.

Those diseases which are "catching," as the saying is, are usually attended with a special affection of some part of the body, and it is supposed to be especially these parts which contain the contagia. In these parts there is often rapid growth, and if the parts are on the surface they often become detached.

In typhus fever the skin is a good deal affected, and it is generally supposed that it is from the skin the poison spreads, as this complaint is easily carried by the clothes. In scarlet fever the scales of skin, and the epithelium from the mouth and throat, are highly dangerous, the pus and epidermis of small-pox, and the skin and bronchial secretions of measles. It has also been alleged that the discharges in cholera, and the stools of patients during enteric fever, are capable of conveying the particular poison of the disease.

The portions of the body thus thrown off, and containing the contagia, may then pass into the air, or find their way into water or food, and in this way be introduced by breathing, drinking, or eating, or through broken surfaces of the body. The names of the more common catching diseases are as follows: Typhus and scarlet fevers (and a nurse should also regard enteric fever as catching), diphtheria, erysipelas, small-pox, measles, chicken-pox, hooping-cough. There are also several others not so common, which I need not enumerate.

The way in which a nurse can best help to check the spread of contagious diseases is by attending most scrupulously to the disinfection of all clothing, linen, and other articles which it is possible may convey contagia.

I believe the only disinfectants which have really stood the test of time and experience are the fumes of sulphurous acid, and exposure to a temperature of not less than 212° Fahrenheit.

In most hospitals there are hot-air chambers, which

are used for baking infected clothes ; but if these be not available, the clothes should be suspended on lines in a room, which should, after having been properly closed, be thoroughly fumigated with the fumes of sulphurous acid. Rooms should be purified after having been used by patients suffering from infectious diseases in the following manner :—

“In addition to thorough cleansing of all wood-work with soft soap and water, and to removal and washing of all fabrics which can be removed, the room should be fumigated for three hours with the fumes of sulphurous acid. All doors and windows and the chimney being closed, and curtains taken down, sulphur is put in a metallic dish, a little alcohol is poured on it, and it is lighted. The proportion should be one pound of sulphur for every thousand cubic feet of space ; and in a long room it is best to have the sulphur in two or more places. After three hours the doors and windows should be opened, and kept open for twenty-four or thirty-six hours.”

RECOVERY FROM DROWNING.

Persons are often brought into the wards of a hospital suffering from the effects of immersion in water who are sufficiently treated by the administration of a warm bath and a stimulant ; but it will be useful to you to know the proper method of treating apnoea, whether resulting from drowning, hanging, or any other cause. Though a great part of the treat-

ment may not devolve upon you as nurses to carry out, I will transcribe for you, in his own words, the method introduced by Dr Marshall Hall.

To clear the throat.—Place the patient gently on the face with one *wrist* under the forehead. All fluids and the tongue itself then fall forward, leaving the entrance into the wind-pipe free. If there be breathing, wait and *watch* ; if not, or if it *fail*, try

To excite respiration.—Turn the patient well and instantly on his side, and excite the nostrils with snuff, the throat with a feather, etc., and dash cold water on the face, previously rubbed warm. If there be no success, *lose not a moment but instantly try*

To imitate respiration.—Replace the patient on his face, *raising* and supporting the chest *well* on a folded coat or other article of dress. Turn the body very *gently on the side and a little beyond*, and then briskly on the face alternately ; repeating these measures deliberately, efficiently, and perseveringly *fifteen times* in the minute, occasionally *varying the side*. When the patient reposes on the chest this cavity is compressed by the weight of the body, and respiration takes place ; when he is turned on the side this pressure is removed and inspiration occurs.

When the *prone* position is resumed, *make* equable but efficient *pressure*, with brisk movement, *along* the back of the *chest*, *removing* it immediately before rotation on the side. The first measure augments the respiration, the second commences inspiration. The result is respiration, and if not too late—Life.

To induce circulation and warmth, rub the limbs

upwards with *firm, grasping pressure*, and with *energy*, using handkerchiefs, etc. By this measure the blood is propelled along the veins to the heart. Avoid the continuous warm bath and the position on or inclined to the back.

WEIGHTS AND MEASURES.

The following are the abbreviations used in Apothecaries' Measure :

Pound lb., ounce \mathfrak{z} , drachm \mathfrak{z} , scruple \mathfrak{D} , grains *grs.*

Apothecaries' Weight.

lb.	\mathfrak{z}	\mathfrak{z}	\mathfrak{D}	<i>gr.</i>
1	= 12	= 96	= 288	= 5760
	1	= 8	= 24	= 480
		1	= 3	= 60
			1	= 20

PROPORTIONS OF THE WINE GALLON.

The abbreviations used in fluid measure are :

Gallon *cong.*, pint *oct.*, fluid ounce \mathfrak{z} , fluid drachm \mathfrak{z} ,
minim \mathfrak{m} .

Wine Measure.

<i>Cong.</i>	<i>oct.</i>	\mathfrak{z}	\mathfrak{z}	\mathfrak{m}	<i>gr.</i>
1	= 8	= 128	= 1024	= 61440	= 58327.5
	1	= 16	= 128	= 7680	= 7291
		1	= 8	= 480	= 455.6
			1	= 60	= 57

 ABBREVIATIONS USED IN PRESCRIPTIONS.

- A.h.—*Alternis horis*.—Every other hour.
 A.n.—*Alternis noctibus*.—Every other night.
 Aq. dist.—Distilled water.
 Baln. tep.—*Balneam tepidam*.—Warm bath.
 Bis in d.—*Bis in dies*.—Twice a day.
 Cat.—*Cataplasm*.—Plaster.
 C.m.—*Cras mane*.—To-morrow morning.
 C.n.—*Cras nocte*.—To-morrow evening.
 D.a.—*Diebus alternis*.—Every other day.
 Dieb. tert.—*Diebus tertiis*.—Every third day.
 Emp.—*Emplastrum*.—Plaster.
 H.d. Hor. decub.—*Horâ decubitûs*.—At going to bed.
 H.s. Hor. som.—*Horâ somni*.—Just before going to sleep.
 Lat. dol.—*Lateri dolenti*.—To the side affected.
 Mixt.—*Mixtura*.—A mixture.
 N.—*Nocte*.—At night.
 O.h.—*Omni horâ*.—Every hour.
 Post sing. sed. liq.—*Post singulas sedes liquidas*.—After every loose stool.
 P.r.n.—*Pro re natâ*.—According as circumstances may require.
 Si op. sit.—*Si opus sit*.—If there be occasion.
 Ung.—*Unguentum*.—Ointment.
-

I subjoin a glossary of some of the commoner terms used in medicine and surgery, warning you at the same time that you will find amongst them only those in most ordinary use.

- Abdomen.**—The cavity situated between the pelvis and the thorax.
Abortion.—Premature delivery; miscarriage.
Abscess.—A collection of pus in some tissue or organ.

- Anæsthesia*.—Insensibility to pain.
- Ague*.—An intermittent fever.
- Anodyne*.—A remedy against pain.
- Antidote*.—A remedy against the action of poison.
- Antiseptic*.—A preventitive of putrefaction.
- Anus*.—The lower termination of the intestinal canal.
- Aperient*.—A mild purgative.
- Aphasia*.—Speechlessness.
- Ascites*.—Dropsy.
- Auscultation*.—Listening.
- Battery*.—An apparatus for giving electric shocks.
- Bistoury*.—A small knife for surgical operations.
- Bougie*.—An instrument made in the shape of a cylinder, used to dilate contracted passages.
- Caries*.—Decay, generally applied to ulceration of bone.
- Cautery*.—An instrument used for applying heat.
- Clinical*.—Belonging to the bed, a term applied to lectures delivered at the bedside.
- Constipation*.—A confined state of the bowels.
- Contusion*.—A bruise.
- Convulsion*.—A violent irregular contraction of the muscles.
- Crisis*.—A deciding point.
- Cyst*.—A sort of tumour.
- Diagnosis*.—The act of distinguishing the nature of disease.
- Director*.—A small surgical instrument.
- Emetic*.—A medicine which produces vomiting.
- Expectorate*.—To cough or spit up.
- Fæces*.—The refuse material expelled from the bowels.
- Flatulence*.—Wind or gas in the stomach or bowels.
- Forceps*.—A surgical instrument, something like pincers.
- Irrigate*.—To keep some part moist by means of the constant dropping of water or lotion.
- Lesion*.—A hurt, injury, or wound.
- Ligature*.—Thread or silk which is used for tying arteries, etc.
- Liniment*.—An external application.
- Lithotomy*.—The operation of cutting into the bladder to remove a stone.

Lithotrity.—The operation of crushing a stone in the bladder.

Micturition.—The act of making water.

Narcotic.—A medicine which produces sleep.

Neuralgia.—Pain of the nerve.

Obstetric.—Belonging to midwifery.

Edema.—A swelling of a watery nature.

Omentum.—A fold of fat in front of the intestines.

Pathology.—The study of the nature of disease.

Pharmacopœia.—A list of medicines.

Phthisis.—Consumption.

Probe.—A small bodkin-shaped surgical instrument.

Prognosis.—The opinion as to the result of an illness.

Quinsey.—An inflammation of the throat, often accompanied by abscesses.

Rhonchus.—Rattling in the throat.

Salines.—Cooling medicines, containing alkaline salts.

Serum.—The watery part of the blood.

Sinapism.—A mustard plaster.

Spatula.—A surgical instrument like a blunt knife, used in preparing and spreading outwards a plaster.

Speculum.—An instrument used in the examination of internal parts.

Stethoscope.—An instrument for listening to the sounds of the heart and lungs.

Suture.—A stitch.

Thermometer.—An instrument for ascertaining the temperature.

Tubercle.—A small projection.

Uterus.—The womb.

Vagina.—The canal leading to the womb.

Vertigo.—Giddiness.

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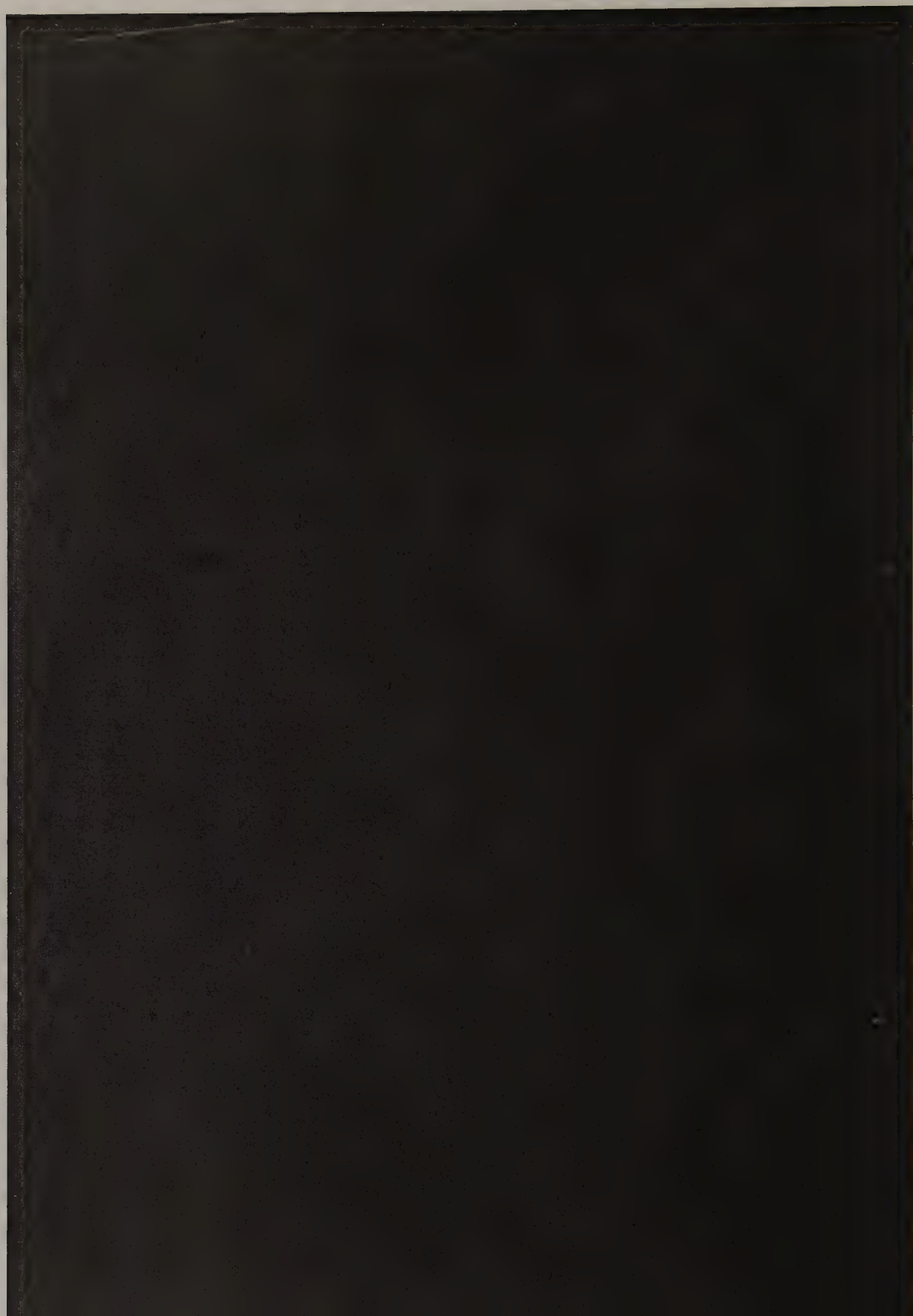
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